

RECOMMENDATIONS

COMMISSION RECOMMENDATION

of 11 October 2010

on the application of Article 37 of the Euratom Treaty

(2010/635/Euratom)

THE EUROPEAN COMMISSION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Article 37 thereof in conjunction with Article 106a referring to Article 292 of the Treaty on the Functioning of the European Union,

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 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) Experience has been acquired in the application of the Commission Recommendations of 16 November 1960 ⁽¹⁾, 82/181/Euratom ⁽²⁾ 91/4/Euratom ⁽³⁾ and 1999/829/Euratom ⁽⁴⁾ concerning the application of Article 37 of the Treaty.
- (3) The Court of Justice of the European Union, in its judgment of 22 September 1988 in Case 187/87 ⁽⁵⁾, ruled that Article 37 of the Euratom Treaty must be interpreted as meaning that the European Commission shall be provided with general data before the discharge authorisation of radioactive effluents is granted by the Member State concerned, in order to make it possible for the Commission to issue its opinion before such discharges are authorised so that the Commission's opinion can be taken into account.
- (4) Article 37 has as its objective to forestall any possibility of radioactive contamination of another Member State. The Commission, having consulted the abovementioned group of experts has deemed the disposal of radioactive waste associated with certain operations not to be liable to result in the radioactive contamination of another Member State.
- (5) 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; the Commission's opinion may then pertain to an authorisation which has been granted at an earlier stage.
- (6) 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.
- (7) Mixed-oxide fuel fabrication plants process large amounts of plutonium oxide, a submission of general data for the dismantling of such plants should be required as is already the case for the dismantling of nuclear reactors and reprocessing plants.
- (8) Trivial operations having no or negligible radiological impact in other Member States should not be submitted to the Commission.
- (9) Member States may communicate an integrated submission for a complex site where major changes are scheduled to be carried out over a long period of time, involving several steps and including the operation of new facilities, and the completeness of the information contained in the initial general data should allow the Commission to fulfil its obligations pursuant to Article 37 of the Euratom Treaty and deliver a sound opinion.

⁽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⁾ OJ L 324, 16.12.1999, p. 23.

⁽⁵⁾ [1988] ECR 5013.

- (10) In view of the number of existing nuclear plants on which no opinion has already been issued within the meaning of Article 37 of the Treaty and which may be subject to modifications or dismantling operations, it is necessary to specify which information is to be supplied as the general data to allow the Commission to fulfil its obligation without prejudice to the principle of equity between installations subject to modifications and those which are not.
- (11) In cases where the exposure of the population in the vicinity of the site of interest is very low, this information may be sufficient for the assessment of the impact on other Member States.
- (12) To appraise in a consistent manner the radiological impact on other Member States of accidental situations, information requested in the general data on unplanned releases from nuclear reactors and reprocessing plants should be extended beyond the reference accidents to accidents taken into consideration for the establishment of the site related national emergency plan.
- (13) To clarify and limit the information required by the Commission pertaining to the predisposal management of radioactive waste and to modifications of a plan on which no opinion has already been issued by the Commission, two new annexes have been included.
- (14) All Member States have now declared that they will desist from sea dumping and no Member State intends to carry out sub-seabed burial of radioactive waste,
- (6) the storage of irradiated nuclear fuel⁽¹⁾ in dedicated facilities (except storage of irradiated nuclear fuel in casks licensed for transport or storage, on existing nuclear sites);
- (7) the handling and processing of artificial radioactive substances on an industrial scale;
- (8) the predisposal management⁽²⁾ of radioactive waste arising from operations (1) to (7) and (9);
- (9) the dismantling⁽³⁾ of nuclear reactors, mixed-oxide⁽⁴⁾ fuel fabrication plants and reprocessing plants (except research reactors whose maximum power does not exceed 50 MW continuous thermal load);
- (10) the emplacement of radioactive waste above or under the ground without the intention of retrieval;
- (11) the industrial processing of naturally occurring radioactive materials subject to a discharge authorisation;
- (12) all other relevant operations.
2. 'General data' within the meaning of Article 37 of the Treaty should be understood to mean:
- for operations referred to in point 1(1) to (7), the information set out in Annex I,
 - for operations referred to in point 1(8), the information set out in Annex II,
 - for operations referred to in point 1(9), the information set out in Annex III,
 - for operations referred to in point 1(10), the information set out in Annex IV,
 - for operations referred to in point 1(11), the relevant parts of the information set out in Annex I (Sections 6 and 7 of Annex I are in most cases not applicable).

HAS ADOPTED THIS RECOMMENDATION:

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

- (1) the operation of nuclear reactors (except research reactors whose maximum power does not exceed 1 MW continuous thermal load);
- (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;

⁽¹⁾ Provided that the operation is not incorporated in a plan submitted under another heading.

⁽²⁾ The term 'predisposal management' includes storage of radioactive waste.

⁽³⁾ Decommissioning comprises all technical and administrative procedures, activities and measures taken after the final shut-down of a facility and up to the release of the site for unrestricted or other licensed use. Within these activities 'dismantling' comprises disassembling, cutting and demolition of contaminated or activated components, systems and structures including their packaging and transfer off-site.

⁽⁴⁾ Oxides of uranium and plutonium.

3. Operations falling within the scope of point 1(12) should be deemed not to be liable to result in the radioactive contamination of another Member State, significant from the point of view of health, unless in any specific case the Commission calls for general data to be provided.
4. For operations falling within the scope of point 1(9), the submission of general data should be governed by the following conditions:
- (a) submission of general data is necessary if
- a new licence or authorisation for a plan for the disposal of radioactive waste in whatever form for the dismantling is envisaged by the Member State, or
 - dismantling of the contaminated or activated parts of the plant will be started;
- (b) if a Member State envisages dismantling an installation referred to in point 1(9) on which no opinion has already been given under the terms of Article 37, the general data should be submitted in the form of Annex III;
- (c) if a Member State envisages dismantling a plant referred to in point 1(9) on which an opinion has already been given under the terms of Article 37, the general data should be submitted in the form of Annex III. However, with regard to the description of the site and its surroundings, the emergency plans and the environmental monitoring, reference to the general data submitted for the earlier procedure is sufficient if all appropriate additional information is provided as regards possible changes.
5. If a Member State envisages modifying ⁽¹⁾ a plan for the disposal of radioactive waste, the submission of general data should be governed by the following conditions:
- (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 V is necessary if the authorised limits or the associated requirements for the disposal of radioactive waste are less restrictive than in the existing plan or if the potential consequences of the unplanned releases which may follow the accident(s) evaluated in the licensing procedure are increased;
- (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;
- (c) unless the Commission calls for general data to be communicated, no submission of general data is necessary 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 unplanned releases which may follow the reference accident(s) evaluated in the licensing procedure are unchanged or decreased;
- (d) 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 (b) and (c) are met. If any of these conditions are not met, the general data should contain the relevant information set out in Annex VI.
6. The general data should be submitted to the Commission:
- (a) after the plan for the disposal of radioactive waste is firmly established, and whenever possible one year but not less than six months:
- before any authorisation for the discharge of radioactive waste is granted by competent authorities, and
 - before start-up of those operations for which no authorisation for the discharge of radioactive waste is foreseen;
- (b) 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 should be reviewed in the light of the Commission's subsequent opinion.

⁽¹⁾ Modifications of a plan might also include preparatory work in view of the operations referred to in point 1(9).

7. Where Member States communicate an integrated submission of general data for a complex site where major changes are scheduled to be carried out over long periods of time, involving several steps and including, inter alia, the operation of new facilities, the initial submission should contain a complete and detailed overview of the planned operations, to be updated by subsequent submissions in case of any modifications to the existing plan. As regards the accident scenarios in the initial submission, the general data should include at least information on estimated amounts and physico-chemical forms of radionuclides present in each of the facilities on the site as well as quantities assumed to be released in the event of the accident considered for each of those facilities. The general data may provide background on past and current operations on the site, bearing in mind that the Commission's opinions will relate only to future operations.
8. Since submission of a plan for the disposal of radioactive waste is the responsibility of the relevant Member State, that State should accept responsibility for all information submitted to the Commission in respect of such a plan.
9. Following receipt of an opinion, the Member State concerned should inform the Commission of the actions it envisages in response to any recommendation given in the Commission opinion on a disposal plan.
10. Following receipt of an opinion, the Member State concerned should communicate to the Commission the discharge authorisation as well as any later amendments for comparison with the information in the general data on which the Commission opinion was based.

This Recommendation is addressed to the Member States.

It replaces Recommendation 1999/829/Euratom.

Done at Brussels, 11 October 2010.

For the Commission
Günther OETTINGER
Member of the Commission

ANNEX I

General data applicable to the operations referred to in point 1(1) to (7)

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, including geological features,
- 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 relevant 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 waterbody 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, floodplains, 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,
- extreme weather phenomena (for example, tornadoes, severe storms, heavy rainfall, droughts).

1.5. **Natural resources and foodstuffs**

Brief description of:

- 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 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, other nuclear facilities and any hazardous industrial or military activities, surface and aerial traffic, pipelines, storages 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 of systems and provisions to confine radioactive substances
 - 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,
 - for operations listed under (1) and (2), key radionuclides and associated detection limits should at least fulfil the specifications laid down in Commission Recommendation 2004/2/Euratom ⁽¹⁾,
 - alarm levels, intervention actions (manual and automatic).
 - 3.4. **Evaluation of transfer to man**

Except for operations listed under (1) and (2), if the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 µSv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected ⁽²⁾ Member States are required if doses to the reference groups in the vicinity of the plant are provided.

⁽¹⁾ Commission Recommendation of 18 December 2003 on standardised information on radioactive airborne and liquid discharges into the environment from nuclear power reactors and reprocessing plants in normal operation (OJ L 2, 6.1.2004, p. 36).

⁽²⁾ Affected Member States are to be selected by taking into account distance from the installation, wind direction for gaseous effluent releases and the route of water courses for liquid effluent releases.

3.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:

- atmospheric dispersion of the effluents,
- ground deposition and re-suspension,
- 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 envisaged discharge limits cited in 3.1 above:

- 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 plant and in other affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected 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,
- for operations listed under (1) and (2), key radionuclides and associated detection limits should at least fulfil the specifications laid down in Recommendation 2004/2/Euratom,
- alarm levels, intervention actions (manual and automatic).

4.4. **Evaluation of transfer to man**

Except for operations listed under (1) and (2), if the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 µSv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected Member States are required if doses to reference groups in the vicinity of the plant are provided.

4.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:

- 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 above:
- annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the plant and in other affected Member States,
 - for the reference group(s) in the vicinity of the plant and in other affected 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 OF SOLID RADIOACTIVE WASTE FROM THE INSTALLATION
- 5.1. **Solid radioactive waste**
- categories of solid radioactive waste and estimated amounts,
 - processing and packaging,
 - storage arrangements on site.
- 5.2. **Radiological risks to the environment**
- assessment of risks to the environment,
 - precautions taken.
- 5.3. **Off-site arrangements for the transfer of waste**
- 5.4. **Release of materials from the requirements of the basic safety standards**
- national strategy, criteria and procedures for the release of contaminated and activated materials,
 - clearance levels established by competent authorities for disposal, recycling and reuse,
 - 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**
- In addition, for operations (1) and (2) accidents taken into consideration by the competent authorities for the establishment of the site related national emergency plan.*
- Outline of the accident(s) considered and reasons for its (their) choice
- 6.3. **Evaluation of the radiological consequences of the reference accident(s) and for operations (1) and (2), the accident(s) taken into consideration by the competent authorities for the establishment of the site related national emergency plan**
- 6.3.1. Accidents entailing releases to atmosphere
- Except for operations listed under (1) and (2), if the assessed maximum exposure levels from the reference accident to adults, children and infants in the vicinity of the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.*
- 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, re-suspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways in the vicinity of the plant and for other affected Member States,

- 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 affected Member States,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected Member States taking account of all significant exposure pathways.

6.3.2. Accidents entailing releases into an aquatic environment

Except for operations listed under (1) and (2), if the assessed maximum exposure levels from the reference accident to adults, children and infants close to the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected 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 radioactive substances 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 above, monitoring programs 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 II

General data applicable to the operation referred to in point 1(8)**The predisposal management of radioactive waste arising from the operations referred to in point 1(1) to (7) and (9)**

Introduction

- general presentation of the plan,
- present stage of licensing procedure, and
- 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, including geological features,
- 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 relevant 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 waterbody 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, floodplains, 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,
- extreme weather phenomena (for example, tornadoes, severe storms, heavy rainfall, droughts).

1.5. **Natural resources and foodstuffs**

Brief description of:

- 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 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, other nuclear facilities and any hazardous industrial or military activities, surface and aerial traffic, pipelines, storages 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,
- description of radioactive waste to be received for storage and processing, facilities and storage capacities, categories and types of radioactive waste (for example, low or intermediate level, metal, combustible waste) to be stored and processed, including volumes and radionuclide content,
- 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 secondary liquid waste treatment facilities, storage capacities and discharge systems, including flow diagrams

2.4. **Solid waste treatment**

Description of secondary solid waste treatment facilities and storage capacities

2.5. **Containment**

Description of systems and provisions to confine radioactive substances

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 expected,
- 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

If the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 μ Sv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected ⁽¹⁾ Member States are required if doses to the reference groups in the vicinity of the plant are provided.

3.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:

- atmospheric dispersion of the effluents,
- ground deposition and re-suspension,
- food chains, inhalation, external exposure etc.,
- living habits (diet, exposure time etc.),
- other parameter values used in the calculations.

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

- 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 affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected 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 expected,
- 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

If the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 μ Sv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected Member States are required if doses to reference groups in the vicinity of the plant are provided.

⁽¹⁾ Affected Member States are to be selected by taking into account distance from the installation, wind direction for gaseous effluent releases and the route of water courses for liquid effluent releases.

4.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:

- 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 above:

- annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the plant and in other affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected 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 OF SOLID RADIOACTIVE WASTE FROM THE INSTALLATION

5.1. **Solid radioactive waste**

- categories of solid radioactive waste and estimated amounts,
- processing and packaging,
- storage arrangements on site.

5.2. **Radiological risks to the environment**

- assessment of risks to the environment,
- precautions taken.

5.3. **Off-site arrangements for the transfer of waste**

5.4. **Release of materials from the requirements of the basic safety standards**

- national strategy, criteria and procedures for the release of contaminated and activated materials,
- clearance levels established by competent authorities for disposal, recycling and reuse,
- 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. Accidents entailing releases to atmosphere

If the assessed maximum exposure levels from the reference accident to adults, children and infants in the vicinity of the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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, re-suspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways in the vicinity of the plant and for other affected Member States,
- 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 affected Member States,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected Member States taking account of all significant exposure pathways.

6.3.2. Accidents entailing releases into an aquatic environment

If the assessed maximum exposure levels from the reference accident to adults, children and infants close to the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected 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 radioactive substances 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 above, monitoring programs 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 III

General data applicable to the operations referred to in point 1(9)**The dismantling of nuclear reactors, mixed-oxide fuel fabrication plants and reprocessing plants (except research reactors whose maximum power does not exceed 50 MW continuous thermal load)**

Introduction

- general presentation of the plan,
- description of the different decommissioning and dismantling phases envisaged,
- decommissioning and dismantling licensing procedures.

1. THE SITE AND ITS SURROUNDINGS

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

- a map of the region showing the location and geographical coordinates (degrees, minutes) of the site,
- the relevant features of the region, including geological features,
- 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 relevant conurbations, together with their populations.

1.2. **Hydrology**

For an installation situated near to a waterbody 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, floodplains, 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,
- extreme weather phenomena (for example, tornadoes, severe storms, heavy rainfall, droughts).

1.4. **Natural resources and foodstuffs**

Brief description of:

- 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 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 during dismantling, in normal conditions and in the case of an accident, including flow diagrams
 - 2.3. **Liquid waste treatment**

Description of liquid waste treatment facilities during dismantling, storage capacities and discharge systems, including flow diagrams
 - 2.4. **Solid waste treatment**

Description of solid waste treatment facilities and storage capacities at the site during dismantling
 - 2.5. **Containment**

Description of systems and provisions to confine radioactive substances
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 for the dismantling operations, including the assumed radionuclide composition,
 - for comparison: discharge limits and associated requirements in force for the time before the envisaged dismantling operations, including the radionuclide composition.
 - 3.2. **Technical aspects**
 - annual discharges expected during dismantling,
 - 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**

If the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 µSv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected ⁽¹⁾ Member States are required if doses to the reference groups in the vicinity of the plant are provided.

 - 3.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:
 - atmospheric dispersion of the effluents,
 - ground deposition and re-suspension,
 - food chains, inhalation, external exposure etc.,
 - living habits (diet, exposure time etc.),
 - other parameter values used in the calculations.

⁽¹⁾ Affected Member States are to be selected by taking into account distance from the installation, wind direction for gaseous effluent releases and the route of water courses for liquid effluent releases.

3.4.2. Evaluation of the concentration and exposure levels associated with the envisaged discharge limits for the dismantling operations cited in 3.1 above:

- 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 plant and in other affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected Member States, corresponding annual exposure levels: effective dose to adults, children and infants, 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 for the dismantling operations, including the assumed radionuclide composition,
- for comparison: discharge limits and associated requirements in force before the envisaged dismantling operations, including the radionuclide composition.

4.2. **Technical aspects**

- annual discharges expected during dismantling,
- 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**

If the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 μ Sv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected Member States are required if doses to reference groups in the vicinity of the plant are provided.

4.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:

- 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 envisaged discharge limits for the dismantling operations cited in 4.1 above:

- annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the plant and in other affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected Member States, corresponding annual exposure levels: effective dose to adults, children and infants, taking account of all significant exposure pathways.

5. DISPOSAL OF SOLID RADIOACTIVE WASTE FROM THE INSTALLATION
 - 5.1. **Solid radioactive wastes**
 - categories of solid radioactive wastes and estimated amounts,
 - processing and packaging,
 - storage arrangements on site.
 - 5.2. **Radiological risks to the environment**
 - assessment of risks to the environment,
 - precautions taken.
 - 5.3. **Off-site arrangements for the transfer of waste**
 - 5.4. **Release of materials from the requirements of the basic safety standards**
 - national strategy, criteria and procedures for the release of contaminated and activated materials,
 - clearance levels established by competent authorities for disposal, recycling or reuse,
 - 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. Accidents entailing releases to atmosphere

If the assessed maximum exposure levels from the reference accident to adults, children and infants in the vicinity of the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

 - 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, re-suspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways in the vicinity of the plant and for other affected Member States,
 - 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 affected Member States,
 - expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
 - corresponding maximum exposure levels: effective dose to adults, children and infants in the vicinity of the plant and in relevant areas of other affected Member States taking account of all significant exposure pathways.
 - 6.3.2. Accidents entailing releases into an aquatic environment

If the assessed maximum exposure levels from the reference accident to adults, children and infants close to the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected 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.

In the case of reactors no data are required if all nuclear fuel has been transferred off-site to a licensed facility or to an on-site storage facility, on which an opinion has already been given under the terms of Article 37.

8. ENVIRONMENTAL MONITORING

- external radiation monitoring,
- monitoring of radioactive substances 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 above, monitoring programs 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 IV

General data applicable to the operations referred to in point 1(10)**The emplacement of radioactive waste above or under the ground without intention of retrieval**

Introduction

- general presentation of the waste emplacement plan,
- general presentation of the repository, type and class of waste,
- present stage of project and licensing procedure, envisaged commissioning and licensing steps,
- timescale, 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 coordinates (degrees, minutes) of the site,
- the relevant features of the region, including geological features,
- 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,
- anticipated changes in geography and topography over the time period considered for the assessment of post-closure impact.

1.2. **Geology and seismology**

- geological setting,
- active tectonic processes, historical earthquakes, the degree of seismic activity in the region; probable maximum seismic activity,
- structural and geotechnical soil characteristics, soil liquefaction (*as appropriate*),
- surface processes (landslides and erosion) ⁽⁶⁾,
- anticipated changes in geology over the time period considered for the assessment of post-closure impact.

1.3. **Hydrology and hydrogeology**

A brief description of hydrological features providing a potential contamination pathway to another Member State:

- regional and local water tables and their seasonal variations,
- ground water flow direction and velocity, water discharge and extraction points,
- existing and projected major water users, location of the repository with respect to potential potable water aquifers,
- brief description of the surface water bodies (rivers, lakes, estuary, water abstraction, floodplains, etc.) and littoral areas (*as appropriate*),
- average, maximum and minimum water flows and their frequency of occurrence (*as appropriate*),
- chemical composition of ground water,
- flood risk and protection of the installation (*as appropriate*),
- anticipated changes in hydrology, hydrogeology over the time period considered for the assessment of post-closure impact.

1.4. **Meteorology and climate**

A brief description of climate and meteorological features:

- wind directions and speeds,
- precipitation intensity (rain and snow) and duration,
- temperature (average, minimal and maximal),
- atmospheric dispersion conditions,
- extreme weather phenomena (for example, tornadoes, severe storms, heavy rainfalls, droughts) ^(a),
- anticipated changes of climate (for example, glacial effects, potential impact of global warming), and, for coastal sites, sea level changes and coastal erosion over the time period considered for the assessment of post-closure impact.

1.5. **Natural resources and foodstuffs**

A brief description of:

- 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 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,
- assumptions made on future population patterns, habits and food sources.

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

- where appropriate, other nuclear facilities and any hazardous industrial or military activities, surface and aerial traffic, pipelines, storages and any other factors which may have an influence on the safety of the installation,
- protection measures (*as appropriate*),
- anticipated evolution of activities over the time period considered for the assessment of long-term impact.

2. THE REPOSITORY

2.1. **Conceptual approach and design**

- disposal concept,
- depth and location in relation to geological strata (*as appropriate*) ^(b),
- design criteria for natural phenomena,
- waste emplacement methods, backfill and sealing strategy and methods,
- safety approach: role of the geological and engineered barriers,
- closure of repository,
- approach to retrievability of waste (if applicable),
- auxiliary waste treatment, conditioning and buffer storage facilities to be constructed at the site of the repository.

2.2. Wastes to be disposed of in the repository

- types of waste,
- waste form, applied conditioning methods and characteristics of waste packages (*as appropriate*),
- waste inventory; amounts and radionuclide activities,
- potential heat generation, potential gas generation, potential criticality (*as appropriate*),
- waste acceptance requirements/criteria, waste package verification procedure and techniques to ensure compliance with established waste acceptance criteria.

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 (*as appropriate*)

2.4. Drainage system and the treatment of liquid effluents

Description of potentially contaminated water collection, drainage and discharge systems, in normal conditions and in the case of an accident (*as appropriate*)

2.5. Management of secondary solid and liquid waste in normal conditions and in the case of an accident

- categories of secondary liquid and solid radioactive waste and estimated amounts,
- storage and transportation of waste,
- treatment of waste.

3. RELEASE FROM THE INSTALLATION OF AIRBORNE RADIOACTIVE EFFLUENTS IN NORMAL CONDITIONS

During normal operation of waste disposal facilities only very minor releases of radioactive substances, if any, are expected and significant exposure of members of the public is not anticipated. Therefore this section is not applicable if there is no authorisation for radioactive discharges granted. However, if radionuclide discharge limits are prescribed and discharge monitoring is in place, the general data must be submitted according requirements specified in Section 3 of Annex II.

4. RELEASE FROM THE INSTALLATION OF LIQUID RADIOACTIVE EFFLUENTS IN NORMAL CONDITIONS

During normal operation of waste disposal facilities only very minor releases of radioactive substances, if any, are expected and significant exposure of members of the public is not anticipated. Therefore this section is not applicable if there is no authorisation for radioactive discharges granted. However, if radionuclide discharge limits are prescribed and discharge monitoring is in place, the general data must be submitted according requirements specified in Section 4 of Annex II.

5. DISPOSAL OF SOLID RADIOACTIVE WASTE FROM THE INSTALLATION

This section is normally not applicable.

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. Accidents studied in the safety assessment report and evaluated radiological consequences in the case of unplanned releases.

6.2. Evaluation of the radiological consequences of releases to atmosphere

If the assessed maximum exposure levels from the reference accident to adults, children and infants in the vicinity of the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected ⁽¹⁾ Member States are required if exposure levels in the vicinity of the plant are provided.

- 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,

⁽¹⁾ Affected Member States are to be selected by taking into account distance from the installation, wind direction for gaseous effluent releases and the route of water courses for liquid effluent releases.

- models and parameter values used to calculate for the releases their atmospheric dispersion, ground deposition, re-suspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways in the vicinity of the plant and for other affected Member States,
- 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 affected Member States,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected Member States taking account of all significant exposure pathways.

6.3. Evaluation of the radiological consequences of releases into an aquatic environment

If the assessed maximum exposure levels from the reference accident to adults, children and infants close to the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected 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. POST-CLOSURE PERIOD

The different post-closure phases (e.g. active and passive institutional control phases) should be taken into account where appropriate.

8.1. Regulatory and administrative provisions

- plans for the repository closure,
- time periods considered (periods of active and passive institutional control),
- description of measures foreseen for active institutional control period,
- description of measures foreseen for passive institutional control period,

- record-keeping,
- dismantling programme for auxiliary installations,
- periodical safety reviews before closure.

8.2. Radiological impact during post-closure period

If the assessed maximum exposure levels from releases resulting from normal evolution and from early degradation of barriers to adults, children and infants in the vicinity of the installation are below 1 mSv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected Member States are required if doses to reference groups in the vicinity of the plant are provided.

- redundancy and performance of barriers (if relevant),
- time periods considered,
- analysed features, events and processes, description of scenarios assumed (brief descriptions of the normal evolution scenario, most relevant degraded evolution scenarios and human intrusion scenarios),
- methods and techniques used for assessment of radiological impact,
- parameters and assumptions,
- main exposure pathways in vicinity of repository and other affected Member States resulting from normal evolution and for early degradation of barriers,
- activity and timing of radionuclide release,
- corresponding maximum exposure levels: effective doses and/or estimated risks to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected Member States taking account of all significant exposure pathways,
- evaluation of the uncertainties.

9. ENVIRONMENTAL MONITORING

- operational monitoring of external radiation and radioactive substances in air, water, soil and the food chains, whether undertaken by the operator or by competent authorities (sample forms and frequency, type of monitoring instruments used in normal and accident circumstances),
- guidelines for post-closure monitoring of radioactive substances in air, water, soil and the food chains, whether undertaken by the operator or by competent authorities ^(a),
- any collaboration arrangements with neighbouring Member States in respect of environmental monitoring.

Notes:

^(a) Relevant for new surface repositories only.

^(b) Relevant for geological repositories only.

ANNEX V

General data applicable to modifications of a plan on which an opinion has already been given

STANDARD FORM

1. Name and location of the facility concerned:
 2. Date of the Commission's Opinion:
 3. Brief description of the planned modifications:
 4. Authorised discharge limits in the existing plan, and other relevant conditions:
 - 4.1. Gaseous effluents:
 - 4.2. Liquid effluents:
 - 4.3. Solid waste:
 5. New discharge limits envisaged by the authorities, including modifications in the assumed radionuclide composition, and other relevant conditions:
 - 5.1. Gaseous effluents:
 - 5.2. Liquid effluents:
 - 5.3. Solid waste:
 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:
 7. Consequences of the modifications in relation to the disposal of solid waste:
 8. Consequences of the modifications in relation to the reference accident(s) taken into account in the previous opinion:
 9. In the case of new reference accident(s): description and evaluation of the radiological consequences:
 10. Implications of the modifications in relation to the current emergency plans and the current environmental monitoring:
-

ANNEX VI

General data applicable to modifications of a plan on which no opinion has been given yet

Introduction

- general presentation of the plan,
- present stage of licensing procedure.

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, including geological features,
- 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. **Hydrology**

Data mentioned in this section 1.2 are required only if the modification of the discharges from the plant of liquid radioactive effluents in normal conditions envisages less restrictive authorised limits or associated requirements than in the existing plan or if the potential consequences of the reference accident(s) entailing releases into an aquatic environment are increased.

For an installation situated near to a waterbody 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, floodplains, etc.,
- average, maximum and minimum water flows and their frequency of occurrence,
- brief description of the littoral areas,
- direction and force of currents, tides, circulation patterns, both local and regional.

1.3. **Meteorology**

Data mentioned in this section 1.3 are required only if the modification of the discharges from the plant of gaseous radioactive effluents in normal conditions envisages less restrictive authorised limits or associated requirements than in the existing plan or if the potential consequences of the reference accident(s) entailing releases to atmosphere are increased.

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,
- extreme weather phenomena (for example, tornadoes, severe storms, heavy rainfall, droughts).

1.4. **Natural resources and foodstuffs**

Brief description of:

- 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

- brief description of the installation,
- type, purpose and main features of the processes,
- site layout plan,
- safety provisions,
- waste treatment,
- relevant details of the modification.

3. RELEASE FROM THE INSTALLATION OF AIRBORNE RADIOACTIVE EFFLUENTS IN NORMAL CONDITIONS

Data mentioned in this section 3 are required only if the modification of the discharges from the plant of gaseous radioactive effluents in normal conditions envisages less restrictive authorised limits or associated requirements than in the existing plan.

3.1. **Authorisation procedure in force**

- outline of the procedure in force,
- current authorisation limits,
- discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

3.2. **Technical aspects**

- annual discharges expected,
- composition and physico-chemical forms of the radioactive effluents,
- 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

If the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 μ Sv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected Member States are required if doses to the reference groups in the vicinity of the plant are provided.

3.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the installation and for other affected ⁽¹⁾ Member States:

- atmospheric dispersion of the effluents,
- ground deposition and re-suspension,
- food chains, inhalation, external exposure, etc.,
- living habits (diet, exposure time, etc.),
- other parameter values used in the calculations.

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

- 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 plant and in other affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected 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

Data mentioned in this section 4 are required only if the modification of the discharges from the plant of liquid radioactive effluents in normal conditions envisages less restrictive authorised limits or associated requirements than in the existing plan.

4.1. Authorisation procedure in force

- outline of the general procedure involved,
- current authorisation limits,
- discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

4.2. Technical aspects

- annual discharges expected,
- composition and physico-chemical forms of the radioactive effluents,
- management of the effluents, methods and paths of release.

⁽¹⁾ Affected Member States are to be selected by taking into account distance from the installation, wind direction for gaseous effluent releases and the route of water courses for liquid effluent releases.

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

If the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the plant are below 10 μ Sv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on effective doses in other affected Member States are required if doses to reference groups in the vicinity of the plant are provided.

4.4.1. Models, including where appropriate generic models, and parameter values used to calculate the consequences of the releases in the vicinity of the plant and for other affected Member States:

- 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 above:

- annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the plant and in other affected Member States,
- for the reference group(s) in the vicinity of the plant and in other affected 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 OF SOLID RADIOACTIVE WASTE FROM THE INSTALLATION

Data mentioned in this section 5 are required only if the modification of the disposal from the plant of solid radioactive waste in normal conditions envisages less restrictive authorised limits or associated requirements than in the existing plan.

5.1. Solid radioactive waste

- categories of solid radioactive waste and estimated amounts,
- processing and packaging,
- storage arrangements on site.

5.2. Radiological risks to the environment

- assessment of risks to the environment,
- precautions taken.

5.3. **Off-site arrangements for the transfer of waste**

5.4. **Release of materials from the requirements of the basic safety standards**

- national strategy, criteria and procedures for the release of contaminated or activated materials,
- clearance levels established by competent authorities for disposal, recycling and reuse,
- envisaged types and amounts of released materials.

6. UNPLANNED RELEASES OF RADIOACTIVE EFFLUENTS

Data mentioned in this section 6 are required only if the potential consequences of the reference accident(s) are increased.

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

Impact of the modification on the reference accident(s)

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

6.3.1. Accidents entailing releases to atmosphere

Data mentioned in this section 6.3.1 are required only if the potential consequences of the reference accident(s) entailing releases to atmosphere are increased.

If the assessed maximum exposure levels from the reference accident to adults children and infants in the vicinity of the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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, re-suspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways in the vicinity of the plant and for other affected Member States,
- 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 affected Member States,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,

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

If not already submitted under heading 3.3:

- 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).

6.3.2. Accidents entailing releases into an aquatic environment

Data mentioned in this section 6.3.2 are required only if the potential consequences of the reference accident(s) entailing releases into an aquatic environment are increased.

If the assessed maximum exposure levels from the reference accident to adults children and infants close to the plant are below 1 mSv and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, no data on exposure levels in other affected Member States are required if exposure levels in the vicinity of the plant are provided.

- 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,
- expected levels of radioactive contamination of foodstuffs which might be exported to other affected Member States,
- corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other affected Member States taking account of all significant exposure pathways.

If not already submitted under heading 4.3:

- 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).

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

Relevant information in relation with the modification
