Luxembourg

Convention on Nuclear Safety

National report on measures taken by Luxembourg to fulfil each of the obligations laid down in the Convention

Introduction

Luxembourg has no nuclear installations in its national territory.
However, 8.5 km away from its national border there is a French nuclear facility comprising four 1 300-MWe reactors, making a total output of 5 200 MWe.

Since the commissioning of the French nuclear facility in Cattenom in 1986, Luxembourg has had a special emergency plan which will be implemented in the event of an incident or accident at the Cattenom facility. This emergency plan is also applicable in the event of a nuclear accident at another location.

The nuclear emergency plan is regularly updated and tested.

Luxembourg possesses laws and regulations on nuclear safety and radiological safety; these are in conformity with the provisions of the Euratom Treaty, to which Luxembourg is a party. They relate to the protection of the general population as well as to the protection of workers.

In the 1970s, Luxembourg planned to build a nuclear facility. The project was pursued for six years, during which time it went through all the planning stages, with site studies and implementation studies for the chosen facility. At the final stage, when all the nuclear-safety studies had been completed and the Government had drafted the authorisation bill, the project was abandoned for political reasons.

It should be emphasised in this context that the Government had decided that the studies relating to the planned nuclear facility, as well as the commissioning and operation of the facility, would have to comply with all the regulatory provisions applicable in the Federal Republic of Germany. This demonstrates that the laws and regulations in force in Luxembourg on nuclear safety and radiological safety are able to guarantee the establishment and operation of a nuclear installation in conditions of maximum nuclear safety. In fact, the Luxembourg Government had commissioned German bodies specialising in nuclear safety (TÜV-Rheinland, Institut für Reaktorsicherheit, etc.) to check all safety aspects of the Luxembourg nuclear project.

The competent Luxembourg authority in matters of nuclear safety and radiological safety is the Minister of Health (Ministre de la Santé). His powers of control are independent of the promoter of a nuclear installation, which would be the role of the Minister of Energy.

The authority responsible for checking nuclear safety and radiological safety was reinforced by German nuclear-safety experts during the period when the project for a nuclear facility in Luxembourg was being studied.

Obligations under the Convention, article by article

Article 4. Implementation measures

In 1963, a framework law was enacted on the protection of the population against the dangers resulting from ionising radiation.

In implementation of that framework law, two detailed Grand Ducal regulations have been put into force to govern the various aspects of nuclear safety and the protection of the population and workforce from radiation. The regulations are in conformity with the Euratom Treaty and with the directives issued by the Council of the European Union.

The various Luxembourg laws and regulations are listed in Annex I.

Article 5. Submission of reports

The present report constitutes the compulsory report referred to in Article 5.

Article 6. Existing nuclear installations

Luxembourg has no nuclear installations in its territory.

Article 7. Legislative and regulatory framework

Luxembourg has a legislative and regulatory framework designed to govern the safety of nuclear installations (see Annex I).

As we stated in the introduction, our regulations, which provide for maximum nuclear safety, prompted the Government, in the context of a plan to build a nuclear facility in Luxembourg, conceived in the 1970s but subsequently abandoned, to prescribe compliance with all the nuclear-safety provisions applicable in Germany and to commission safety assessments from German bodies specialising in nuclear safety. At the same time, the national supervisory authority, headed by the Minister of Health, was reinforced by German nuclear-safety experts.

Any project to build and/or operate a nuclear installation is subject to prior authorisation by the Government in council. The Minister of Health is responsible for the formalities.

The application for a license is addressed to the burgomasters of the communes concerned. It must contain all the information indicated below. An enquiry is then held at commune level, at which all interested parties are heard. A written record of the proceedings at the enquiry is drawn up.

All documentation relating to the enquiry is submitted for advice to the Minister of Health, to the other interested Ministers, to the Commission of the European Communities and to the College of Medical Practitioners, as well as to national, foreign and international specialised bodies. The Ministry of Health collects all opinions. The applicant for licensing is required to provide additional information on demand. The Government in council lays down the conditions governing the granting of a license. If the license is refused, an explanatory statement must be given to the applicant.

The specific information to be supplied in the license application includes particulars of the applicant organisation, the description of the installation, the site, the number of staff and their qualification levels, civil nuclear liability, plans of the installations and demographic, ecological, geological, seismological and meteorological details of the area within a radius of 25 km.

The application must contain a safety report describing the most serious accidents that could occur in the installations, including an assessment of the probability and foreseeable consequences of each potential accident.

The application must also contain full details of the expected radioactive effluents and on the management, purification and disposal of solid, liquid and gaseous radioactive waste.

All of these data will then be checked by specialised bodies under the supervision of the competent authority to pave the way for a subsequent government decision on the project in question.

Article 8. Regulatory body

The regulatory body is the Ministry of Health. In the case of a project to establish a nuclear installation, the Minister of Health is given the financial and human resources necessary for the fulfilment of the responsibilities assigned to him (cf. notes on Article 7 above). He is granted appropriate powers and jurisdiction in accordance with the applicable legislation.

Article 9. Responsibility of the licensee

The Luxembourg laws and regulations make the operator of an installation responsible for safety, notwithstanding the inspections and checks carried out by the authority responsible for nuclear safety.

Article 11. Financial and human resources

The information provided in the introduction and in the Articles 7 and 8 above demonstrates that the necessary human and financial resources will

be available throughout the study, construction, commissioning, operation and decommissioning phases of any nuclear installation.

Article 12. Human factors

If a nuclear installation were operational in its territory, Luxembourg would take account of all human factors and would apply the methods practised in France or Germany.

Article 13. Quality assurance

The same comments made in relation to Article 12 also apply to Article 13.

Article 14. Assessment and verification of safety

The measures described in Article 14 would be implemented if a nuclear installation were planned or operated in Luxembourg. Please refer to the explanations provided in the introduction and in the notes on Articles 7 and 8 above concerning the tasks entrusted to the German bodies specialising in nuclear safety by the Luxembourg Government at the time of the nuclear-installation project. At that time the competent supervisory authority, i.e. the Ministry of Health, was given extra staff and funding.

Compulsory prior authorisation applies to the choice of the site, to the design, to the construction, operation and decommissioning of a nuclear installation.

Article 15. Radiological safety

Luxembourg complies with the basic standards of radiological safety laid down in the relevant directive of the Council of the European Union.

Radiation limits for the workforce are even set at lower levels than those required under international rules.

The level of irradiation of the general population and workforce must be as low as is reasonably possible, likewise the number of irradiated persons and/or workers.

The cumulative annual radiation to which the organism of any member of the public is exposed must not exceed one millisievert (1 mSv), excluding natural and medical radiation.

No member of the public may be irradiated by gaseous radioactive effluents to a level exceeding 0.3 mSv per annum for the entire organism and 0.9 mSv per annum for the thyroid gland.

No member of the public may be irradiated by liquid radioactive effluents to a level exceeding 0.3 mSv per annum.

The cumulative annual irradiation limit for any worker exposed to radiation in the course of his or her duties is set at 10 mSv for the entire organism.

Special conditions apply to workers under 18 years of age, to pregnant women workers, to apprentices and students and to workers from outside.

All workers who are liable to receive a dose of radiation exceeding one-tenth of the annual irradiation limit must carry a personal dosimeter.

All workers who are liable to receive a dose of radiation exceeding three-tenths of the annual irradiation limit must undergo a medical examination on recruitment and annual medical examinations conducted by an approved physician at their employers expense.

It should be noted that 18 measuring stations for atmospheric radioactivity are operational in Luxembourg. They measure continuously and automatically transmit their findings to the competent authority and to Civil Protection Directorate. In addition, a measuring station is installed in French territory near the Cattenom nuclear facility. It also transmits data continuously to the same two bodies in Luxembourg.

A measuring station for liquid radioactivity effluents is located on the River Moselle at the point where the river enters our national territory. All the measurements from the surveillance stations and from personal dosimeters are processed by the competent authority within the Ministry of Health.

Article 16. Emergency organisation

First of ail, it should be said that, when the Convention on Nuclear Safety was being drawn up, Luxembourg was the country which asked for the inclusion of the third point of Article 16 to the effect that States which have no nuclear installations in their territory but which could be affected by a nuclear accident occurring in a neighbouring nuclear installation must also have an emergency plan and must test it regularly.

As soon as the French nuclear facility in Cattenom, 8.5 km from the Luxembourg border, was commissioned in 1986, the Luxembourg Government adopted a nuclear emergency plan. The original plan of 1986 has subsequently been revised and amended; the most recent amendment was effected on 2 December 1994, pursuant to a Government decision.

The Luxembourg nuclear emergency plan draws upon the corresponding Swiss, German and French plans.

It was submitted for examination and appraisal to the IAEA specialists in Vienna and to Swiss experts and was approved by both groups.

The emergency plan is activated and tested by the competent authorities of the Ministry of Health and by the Civil Protection Directorate of the Ministry of the Interior.

A Grand Ducal regulation was promulgated on 11 August 1996 concerning the provision of information to the population on the applicable measures for the protection of public health and on the conduct to be adopted in the event of a radiological emergency (see Annex I, point 5).

Emergency teams have been formed to assist in the event of a nuclear disaster, and refresher courses are held periodically.

Emergency exercises are organised on a national scale. Joint Franco-Luxembourg and German-Luxembourg exercises are also held at regular intervals. Luxembourg also takes part in international exercises organised by the OECD in which nuclear accidents are simulated.

Special telecommunications hotlines have been installed between the competent Luxembourg, French and German authorities. The Luxembourg authorities also have a direct line to the management of the Cattenom nuclear facility.

Luxembourg has concluded reciprocal agreements on the provision of assistance and information in the event of a nuclear incident with France, Germany and Belgium.

There is even a Luxembourg measuring station in French territory, near the French nuclear facility at Cattenom, which automatically and continuously transmits all atmospheric radioactivity measurements to the authorities in Luxembourg.

The nuclear emergency plan is reproduced in Annex II.

An information brochure, entitled *What to do in the event of a nuclear alert* and printed in four languages, is distributed every five years to each household, as required by law. This brochure, including an English version is joined to the present report.

The national telephone directory includes a page explaining the meaning of the various siren signals and listing the measures to be taken in the event of a nuclear accident (see Annex III).

Within a 25-km radius of the Cattenom nuclear facility, the Luxembourg Government has equipped the communes in the territory of Luxembourg with potassium iodide tablets to protect the thyroid gland in case of emergency. The local authorities are responsible for distributing these tablets. The information brochure distributed to households contains directions for the use of the tablets.

The national authorities also have a reserve supply of potassium iodide tablets (see emergency plan, Annex II).

It should also be pointed out that seven different standard messages to the population, printed in five languages, are contained in the nuclear emergency plan. These are stored at the National Broadcasting Centre and will be revised and adapted as required before being broadcast.

Article 17. Choice of the site

During the 1970s, when Luxembourg had its own plans for a nuclear facility, it complied fully with all the provisions of Article 17, as the national laws and regulations dictated. It also consulted the neighbouring countries about its project and communicated all the relevant data to them.

Article 18. Design and construction

In accordance with its national laws and regulations, if a nuclear installation were to be designed and built, Luxembourg would comply with the provisions of Article 18.

Article 19. Operation

The same remarks made with regard to Article 18 also apply to Article 19.

Annex I

Laws and regulations of the Grand Duchy of Luxembourg relating to the nuclear and radiological safety of the general population and the workforce

(e) Law of 25 March 1963 concerning the protection of the population against the dangers resulting from ionising radiation;
Mémorial (Law Gazette) A, No 18, of 10 April 1963.

(f) Grand Ducal Regulation of 14 December 2000 concerning the protection of the population against the dangers resulting from ionising radiation;
Law Gazette A, No 9 of 22 January 2001.

(g) Grand Ducal Regulation of 11 August 1996 concerning the provision of information to the population on the applicable measures for the protection of public health and on the conduct to be adopted in the event of a radiological emergency;
Law Gazette A, No 64, of 12 September 1996.

Annex II

GRAND DUCHY OF LUXEMBOURG

Ministry of Health

Ministry of the Interior

Special emergency plan for incidents or accidents at the CATTENOM nuclear power station

Approved and enacted by the Government on 2 December 1994

CONTENTS

GLOSSARY OF ABBREVIATIONS

BNS	Base Nationale de Support (National support base for the civil-defence service, Lintgen)
CNA	Centre National d'Alerte (the national emergency operations centre, headquarters of the emergency task force of the civil-defence service)
CSU	Centrale des Secours d'Urgence (Civil-defence service emergency aid centre)
ECURIE	European Community Urgent Radiological Information Exchange. Communication system operated by the European Commission for the rapid exchange of information in the event of a radiological emergency
INES	International Nuclear Event Scale. Drawn up by the International Atomic Energy Agency in Vienna, this scale is designed as a means of assessing the seriousness of incidents or accidents occurring in nuclear installations
NBC	Nuclear, Biological and Chemical Emergency Team of the civil-defence service
SELCA	Système d'Échanges et de Liaisons entre Cattenom et les autorités (System of exchanges and liaison between Cattenom and the public authorities)
STTI GD/POL	Service de traitement et de transmission des informations de la gendarmerie et de la police (Gendarmerie and police information processing and transmission service)
Sv	Sievert: standard unit used to measure the dose of radiation received by an individual as a result of exposure to external radioactive sources or absorption of radioactive substances

O. GENERAL

0.0 The aim of this plan is to alert, protect and assist the Luxembourg population in the event of an accident at the Cattenom nuclear power station. The provisions laid down in this plan may also be applied in the event of any other radiological emergency

0.1 Responsibility for executing the plan lies with the Minister of the Interior and the Minister of Health.

All state services or administrative bodies, whether or not they are referred to in the Following provisions, are required to co-operate by all available means in the effort to achieve the aims set out in this plan. To that end, the administrative bodies concerned shall establish internal procedures which will enable them to comply with the provisions of this plan and to perform the tasks incumbent upon them under the plan.

The local authorities shall also lend their assistance to this effort.

0.2 The plan covers three grades of accident that are liable to occur at the Cattenom power station. For each grade of accident there is a corresponding state of alert and appropriate countermeasures:

(a) **Yellow alert:** A yellow alert shall be activated in the event of a nuclear incident if the consequences of the incident are essentially confined to the site of the nuclear facility. A yellow alert shall be automatically activated if level-2 information is received from the SELCA system and/or the incident falls into category 2 or 3 on the international scale INES. An emergency operations centre shall be set up at the headquarters of the civil-defence service.

(b) **Blue alert:** A blue alert shall be activated in the event of a nuclear accident if it only results in contamination of the River Moselle. An emergency operations centre shall be set up at the headquarters of the civil-defence service.

(c) **Red alert:** A red alert shall be activated in the event of a nuclear accident if there is a risk that a radioactive cloud might be emitted which would affect the national territory of Luxembourg . A red alert shall be automatically activated if level-3 information is received from the SELCA system and if the incident or accident falls into one of categories 4 to 7 on the international scale INES. An emergency operations centre shall be set up at the Senningen military base.

0.3 The protective measures shall relate primarily to the population living within a 25-km radius of the Cattenom site, in conformity with the Government decision of 17 September 1982.

0.4 The area of national territory within a 25-km radius of the Cattenom site shall be known as Area One.

0.5 Area One shall be divided into three civil-defence sectors - East, Centre and West - the eastern and western borders of each sector forming an angle of approximately 45' at the point of convergence (see topographic map under item 0.5.0).

This division makes it possible to activate alarm sirens separately in each sector, depending on the wind direction. In certain circumstances the alarm sirens can

be activated on an even more selective basis - by commune or indeed by locality. This selective system is a means of confining the alert to the areas under actual threat and maintaining economic activity in the rest of the country (see population breakdown by sector in subsection 5.3)

0.6 The protection measures shall, if necessary, be extended beyond Area One.

0.7 The implementation of the measures prescribed in this plan shall be the subject of periodic national exercises and, wherever possible, bilateral and multilateral international exercises.

0.8 The plan shall be adapted in accordance with requirements. To that end, a committee shall be established which shall meet at least once a year with a view to identifying any adaptations that may be required and effecting them.

1. YELLOW ALERT

1.0 General

1.0.0 A yellow alert shall be activated if, following an incident that has occurred at the Cattenom power station, there can be no guarantee that the release of atmospheric or liquid radioactive effluents will not cause contamination of Luxembourg territory. A yellow alert shall be automatically activated if level-2 information is received from the SELCA system and/or the incident falls into category 2 or 3 on the international scale INES.

1.0.1 The nuclear incident in question will, by definition, have consequences which are essentially confined to the site of the Cattenom power station. Nevertheless, as a precaution, NBC radioactivity monitoring and detection teams shall implement a set of measures to produce a representative inventory of the radiological situation as it affects Area One in particular. To that end, it may call on the assistance of the NBC teams of the armed forces. This inventory shall indicate whether preventive measures should be taken in the interests of public health.

1.1 Procedures for announcing the alert and measures to be taken

1.1.0 As soon as the CSU is informed of the nuclear incident by the operator of the Cattenom nuclear power station or the emergency operations centre of the Moselle prefecture, it shall make a confirming call to the French emergency operations centre and shall alert the command staff of

5.0 the civil-defence service, and
6.0 the radiological safety division of the Ministry of Health.

These bodies shall immediately analyse the situation, request additional information as necessary, inform the Government and have the CSU inform the following services as required:

- the laboratory of the radiological safety division of the Ministry of Health,
- the NBC teams of the civil-defence service,
- the food-chemistry unit of the national medical laboratory,
- the water division of the environmental administration,
- the meteorological service of the airport administration,
- the gendarmerie and police information processing and transmission service, and/or
- the board of Luxembourg Railways.

1.1.1 In the event of the CSU receiving an alert from the automatic radioactivity measuring and alerting network, it shall alert the duty officer of the radiological safety division of the Ministry of Health. The latter shall immediately analyse the situation and shall ensure that the command staff of the civil-defence service are alerted.

If need be, the command staff of the civil-defence service and of the radiological safety division of the Ministry of Health shall request additional information, inform the Government and have the CSU alert the services listed in item 1.1.0 above.

1.1.2 The radiological safety division of the Ministry of Health shall immediately initiate a program of biological sampling and radioactivity measurement, taking due account of the meteorological data to be obtained from the meteorological service of the airport administration.

1.1.3 For their radiological analyses they may call on the assistance of the food-chemistry unit of the national medical laboratory and the water division of the environmental administration.

The radiological safety division shall interpret the results of this sampling and measurement program.

The radiological safety division shall produce advance plans, procedures and instructions in writing for the implementation of measures in the field and for sampling in the environment and in the food chain. These procedures shall be regularly practised in the field.

Preventive measures, such as a temporary ban on the consumption of a particular foodstuff, may be taken in the interests of public health.

The population shall be kept informed of the situation through the written and spoken media. Press conferences in the conference room of the civil-defence headquarters shall be called at regular intervals by the press and information group specially established for that purpose.

The gendarmerie and police shall take preparatory measures with a view to directing traffic movements in the event of some of the population moving on their own initiative from Area One to destinations of their choice, even though Area One is not exposed to a risk of radiation from an external source (see traffic plan in subsection 5.4).

2. BLUE ALERT

2.0 General

2.0.0 A blue alert shall be activated if there are discharges of liquid radioactive effluents in the Moselle which are liable to cause radioactive contamination of persons or property without there having been a significant release of atmospheric radioactive effluents.

2.0.1 Such an accident involving radioactive contamination of the waters of the River Moselle will have limited consequences in so far as these waters are not used to supply the Luxembourg population with drinking-water.

Even contact with the water or mud of the Moselle or consumption of fish from that river may have damaging effects on health.

The aim of the measures to be taken is therefore to prevent persons and livestock from coming into contact with the contaminated waters and mud of the Moselle.

To that end, warnings are to be issued to the following persons as a matter of priority:

- boatmen, boatwomen and lock operators,
- the staff of Mertert Docks,
- river-bank and installation maintenance staff,
- anglers and fishers,
- campers,
- participants in water sports,
- farmers, so that they can prevent livestock from drinking contaminated water, and
- all those who might be near the banks of the Moselle or the ponds at Remecherhaff.

In the event of flooding, warnings are also to be issued to riverside residents.

2.1 Procedures for announcing the alert and measures to be taken

2.1.0 As soon as the CSU is informed of the nuclear incident by the operator of the Cattenom nuclear power station or the emergency operations centre of the Moselle prefecture, it shall make a confirming call to the French emergency operations centre and shall alert the command staff of

- the civil-defence service, and
- the radiological safety division of the Ministry of Health.

Should the CSU be alerted of radioactive contamination in a message from the automatic measuring station for the waters of the Moselle, situated at Schengen, it shall alert the duty officer of the radiological safety division of the Ministry of Health. The latter shall immediately analyse the situation and shall ensure that the command staff of the civil-defence service is alerted.

The command staff of the civil-defence service and the radiological safety division shall immediately analyse the situation and request additional information as necessary. If need be, they shall ensure that the members of the NBC teams and the members of the CNA group are alerted.

If the situation demands, a general decision and co-ordination group, a press and information group and an executive group shall be established.

The press and information group is required to transmit a detailed message for broadcasting by the spoken media (see subsection 4.0 below).

2.1.1 The general decision and co-ordination group shall meet in the premises of the national civil-defence service. It shall comprise the official representatives of:

- the radiological safety division,
- the civil-defence service,
- the Ministry of Health, and
- the Ministry of the Interior.

2.1.2 An executive group shall be established. It shall comprise:

- one representative of the armed forces,
- one representative of the gendarmerie,
- one representative of the police,
- one representative of the environmental administration,
- one representative of the national fire service,
- one representative of the waterways unit of the Ministry of Transport,
- one representative of the water division of the highways administration, and
- one representative from the office of the District Commissioner for Grevenmacher.

2.1.3 The following authorities and services, which constitute the executive bodies for this plan, shall be alerted by the CSU:

- The waterways unit of the Ministry of Transport,
- the board of the Mertert river-port management company,
- the water division of the highways administration,
- the gendarmerie and police information processing and transmission unit,
- the Schengen, Remich and Mertert first-aid posts of the civil-defence service,
- the fire brigades in Schengen, Remerschen, Wintrange (commune of Remerschen), Schwebsange, Wellenstein, Bech-Kleinmacher (commune of Wellenstein), Remich, Stadtbredimus, Wormeldange, Machtum (commune of Wormeldange), Grevenmacher, Mertert and Wasserbillig (commune of Mertert),
- the directorate of the forestry commission, the head of the Grevenmacher camp and the rangers responsible for the Remerschen, Wormeldange, Grevenmacher, Remich, Manternach and Canach forest ranges,
- the burgomaster - or, in his or her absence, a deputy burgomaster - of the communes of Remerschen, Wellenstein, Remich, Stadtbredimus, Wormeldange, Grevenmacher and Mertert,
- the food-chemistry unit of the national medical laboratory,
- the water division of the environmental administration,
- the administrative body of the veterinary services, and
- the board of Luxembourg Railways.

2.1.4 The general decision and co-ordination group shall prepare the decisions that the situation dictates and shall submit them to the Government for approval. It shall keep the Government informed of the situation as it develops. The general decision and co-ordination group shall avail itself as required of representatives and specialists from the various administrative bodies that compose the executive group.

The executive group shall direct and co-ordinate all prevention and aid operations. The population shall be kept informed by means of press conference, which shall be called by the press and information group. These shall be held in the conference room of the civil-defence headquarters.

2.1.5 The waterways unit of the Ministry of Transport shall warn boatmen, boatwomen and lock operators by communicating to them the text of the message at item 4.0.5. It shall establish contact with the French and German navigation authorities and, in collaboration with them, shall take the necessary measures in the interests of river navigation. Among other things, these measures may entail the prohibition of restriction of passage and the designation of mooring points for watercraft travelling upstream and for watercraft affected by radioactive effluents. It shall keep the executive group informed of all measures taken.

2.1.6 The board of the Mertert river-port management company shall warn the port employees, as well as the companies and individuals working within the port precinct, by communicating to them the message at item 4.0.5 below.

2.1.7 The water division of the highways administration shall warn the river-bank and installation maintenance staff by communicating to them the message at item 4.0.5 below.

2.1.8 The board of Luxembourg Railways shall warn the staff at Wasserbillig and Mertert-Port railway stations and the drivers of buses travelling alongside the Moselle by communicating to them the message at item 4.0.5 below.

2.1.9 The gendarmerie, the civil-defence first-aid posts, the fire brigades and forest rangers shall warn anglers, campers, water-sport participants and all other persons near the riverbanks against any contact with the contaminated waters and mud of the Moselle and of the Remecherhaff ponds. They shall prohibit access to the banks by unauthorised persons as well as the use of water from the Moselle for the purpose of watering vines or livestock. The gendarmerie shall exercise its duties along the entire course of the Moselle, while the forest rangers, the civil-defence first-aid posts and the fire brigades shall intervene within their respective ranges, areas and communes. In addition, the gendarmerie shall verify the effectiveness of all measures taken, shall inform the executive group of its findings and shall request reinforcements if necessary.

2.1.10 The NBC teams of the civil-defence service shall assemble at the national support base of the civil-defence service in Lintgen, where they shall await instructions on their sampling duties.

The radiological safety division shall produce advance plans, procedures and instructions in writing for the implementation of measures in the field and for sampling in the environment. These procedures shall be regularly practised in the field.

2.1.11 The radiological safety division of the Ministry of Health shall immediately undertake radiological analyses of the samples and shall keep the general decision and co-ordination group informed of the results of its analyses. For its analytical work it may call on the assistance of the food-chemistry unit of the national medical laboratory and the water division of the environmental administration.

2.1.12 The CNA group is responsible for preparing information messages in accordance with European Community procedures for the purpose of rapid communication in the event of a radiological emergency. Once the messages have been checked by the general decision and co-ordination group, the CNA group is responsible for encoding and transmitting them as ECURIE messages. The same messages shall be addressed to the competent French and German authorities.

2.2 Possible subsequent measures

2.2.0 Decontamination posts shall be established as required in a number of previously selected public buildings (see subsection 5.7). They shall be manned by armed-forces personnel, assisted by first-aiders from the civil-defence service and by fire-fighters.

Persons who have been in contact with contaminated water and/or mud shall be directed to one of the stations. They shall be decontaminated there and shall be examined by a physician, who shall administer first aid if necessary.
The activation of these decontamination posts shall be practised on a regular basis.

2.2.1 Any livestock which has been in contact with contaminated water and/or mud shall be isolated in an open-air enclosure, where it shall be decontaminated by being hosed down thoroughly by the local fire brigade in the presence of the livestock owner; it shall then be placed under the surveillance of the veterinary inspectorate.

2.2.2 If the Moselle is in spate, any necessary decontamination of premises, flooded surfaces and sports and recreation areas shall be carried out as directed by the executive group.

3. RED ALERT

3.0 General

3.0.0 A red alert shall be activated if, following a serious accident at the Cattenom nuclear power station, there is a risk of an emitted radioactive cloud moving towards Luxembourg territory and causing radiation which could be damaging to public health. A red alert shall be automatically activated if level-3 information is received from the SELCA system and the incident falls into one of categories 3 to 7 on the international scale INES.

In the event that, following an accident accompanied by a serious failure of the safety systems, the situation cannot be brought under control, the emission of a radioactive cloud will be delayed by a period between about 15 minutes and several days after the occurrence of the accident within the security area of the reactor.

The time lapse between the emission of a radioactive cloud at Cattenom and its arrival over Luxembourg territory may be used to activate the alert and measures for the protection of the population.

Because of the way in which a nuclear accident develops, the emergency plan must be graduated and flexible, and it is possible to take preventive safety measures to afford the population as much protection as can be given against radiation resulting from the nuclear accident.

Serious nuclear accidents are generally characterised by three distinct phases:

- **the initial phase:** from the moment of notification of the accident until radioactive discharges enter the atmosphere,

- **the intermediate phase:** from the first release of radioactive discharges to a few days after the last release of these discharges, and

- **the post-accident phase:** the period following the intermediate phase; the post-accident phase can last from a few days to several months.

Each phase of a serious nuclear accident is characterised by specific prevention or protection measures. These measures take account of the way in which the accident develops and may comprise one or more of the measures listed in item 3.0.1 and subsection 5.0 below. Depending on the situation, these measures may be supplemented at any time by more specific measures.

In principle, preventive and protective measures shall be taken before any radioactive discharges are released.

Specific protection and prevention measures may be taken for children, feeding mothers and pregnant women.
Specific protection and prevention measures may be taken for persons other than members of emergency teams who have reason to re-enter an evacuated area temporarily.

The public shall be immediately informed of the preventive and protective measures taken during the initial, intermediate and post-accident phases. The provisions governing the provision of information to the public are described in subsection 5.14 below.

3.0.1 Preventive and protective measures

The following measures of prevention and protection may be taken:

a.) during the initial phase:

- preventive return home and curfew,
- preventive control of access to areas where there is a risk of contamination,
- public distribution of potassium iodide tablets and provision of directions for use of the tablets,
- organised return home for children from schools, day nurseries, etc., or temporary accommodation of children in these establishments,
- preventive evacuation of the population from areas that may be affected,
- reduction of natural and artificial ventilation of dwelling places,
- disconnection of rainwater-collection systems, and/or
- preventive measures designed to protect foodstuffs, agricultural produce and livestock.

b.) during the intermediate phase:

- confinement in buildings and cellars,
- temporary reduction of natural and artificial ventilation of dwelling places,
- ingestion of potassium iodide tablets,
- disconnection of rainwater-collection systems,
- individual respiratory protection,
- use of protective clothing,
- precautionary measures of personal hygiene,
- personal decontamination,
- evacuation of the population from affected areas,
- control of access to contaminated areas,
- checking and protection of foodstuffs, agricultural produce and livestock, and/or
- restrictions on the use of particular foodstuffs.

c.) during the post-accident phase:

- temporary evacuation of the population from affected areas,
- prolonged evacuation of the population of affected areas,
- control of access to contaminated areas,
- checking and decontamination of property transferred from contaminated areas,
- restriction or suspension of certain open-air activities,
- precautionary measures of personal hygiene,

- checking and protection of foodstuffs, agricultural produce and livestock,
- restrictions on the use of particular foodstuffs,
- draining tanks containing contaminated rainwater,
- personal decontamination,
- decontamination of property,
- decontamination of urban surfaces,
- decontamination of agricultural surfaces,
- restrictions on the use of sewage sludge,
- replacement of air-conditioner filters, ventilator filters, etc., and
- preparation of controlled areas for the storage of contaminated items.

3.0.2 Radiation sources

The total dose of radiation to which the public is exposed in the event of a nuclear accident is made up as follows:

- external irradiation of the entire body by the radioactive cloud (intermediate phase),
- external irradiation of the entire body by the deposition of radioactive fallout on the ground (intermediate and post-accident phase),
- external irradiation resulting from the deposition of dust particles from the radioactive cloud on skin and clothing (intermediate phase),
- internal irradiation by radio-nuclides inhaled during the passage of the radioactive cloud (intermediate phase),
- internal irradiation by radio-nuclides inhaled after the passage of the radioactive cloud when radioactive particles are raised again after having settled (post-accident phase),
- external irradiation after the passage of the radioactive cloud, resulting from the deposition on skin and clothing of radioactive dust particles when radioactive dust particles are raised again after having settled (post-accident phase), and
- internal irradiation resulting from the consumption of contaminated foodstuffs.

The preventive and protective measures provided for in this section shall, where necessary, be combined with those described in section 2 (blue alert).

3.0.3 Intervention thresholds

The confinement of the population in buildings and cellars shall be ordered when the outdoor exposure of the entire body to doses of irradiation during the intermediate phase is estimated at 3 to 25 mSv or when the exposure of the thyroid gland is estimated at 30 to 250 mSv.

It is recommended that potassium iodide tables be taken when the estimated exposure of the thyroid gland amounts to between 30 and 250 mSv.

Evacuation of the population is recommended when it is estimated that the outdoor exposure of the entire body to doses of irradiation during the intermediate phase would amount to between 30 and 300 mSv and that of the thyroid gland to between 300 and 1500 mSv if the population remained in the locality.

It shall be a matter for the Government to decide, on the basis of the grid presented below and in the light of special regional conditions and the circumstances of the accident, the dosage thresholds at which particular measures should be activated.
The Government shall apply the above recommendations, laying down in each specific situation a threshold at or near the lower end of the scales indicated in the grid.

A summary description of the preventive and protective measures is given in subsection 5.0 below.

	Dosages in mSv
Confinement.	
Entire body	3 - 25
Thyroid gland	30 - 250
Evacuation:	
Entire body	30 - 300
Thyroid gland	300 – 1500
Iodide tablets:	
Thyroid gland	30 – 250

3.1 Procedures for announcing the alert and action to be taken in the initial phase

3.1.0 Alerting the authorities and services

3.1.0.0 As soon as the CSU is informed of the nuclear accident by the operator of the Cattenom power station or by the emergency operations centre of the Moselle prefecture, it shall call the French emergency operations centre to confirm the message and shall alert the command staff of

- the civil-defence service, and
- the radiological safety division of the Ministry of Health.

These bodies shall immediately analyse the situation, request additional information as necessary, inform the Government and have the CSU take the following action if the situation so demands:

(a) recall the personnel of the national civil-defence service,
(b) recall the staff of the radiological safety division of the Ministry of Health,
(c) summon the NBC teams of the civil-defence service to the BNS at Lintgen,
(d) summon the CNA group of the civil-defence service to the emergency operations centre,
(e) summon an official representative of the health board to the emergency operations centre,
(f) summon an official representative of the Ministry of the Interior to the emergency operations centre,
(g) ask the telecommunications and alert centre to prepare the installations and special telecommunications facilities for the emergency operations centre,
(h) ask the gendarmerie and police headquarters to make the necessary preparations with a view to directing traffic movements in the event of some of the population moving on their own initiative from Area One to destinations of their choice (see traffic plan in subsection 5.4 below),
(i) summon an official representative of the Government Press and Information Service,
(j) ask the meteorological service of the Luxembourg airport administration to provide details of weather forecasts,
(k) advise the airport administration of any contamination of the air space.

A general decision and co-ordination group shall be established, comprising the official representatives of

- the radiological safety division,
- the civil-defence service,
- the Ministry of Health, and
- the Ministry of the Interior.

The Ministry of the Interior shall take the action required to initiate the administrative procedures for the implementation of the Requisitioning Act and related legislation.

A press and information group shall be established, comprising representatives of the Government Press and Information Service as well as other suitably qualified persons; the unit shall be directly linked to the policy

and co-ordination group. The function of the press and information group shall be to formulate and broadcast messages intended for the general public. Relations with the press and with television companies shall be at the sole discretion of the press and information group. The powers, function and duties of the press and information group are defined at subsection 5.13 below.

If necessary, the following persons, who constitute the executive group, shall be summoned to the emergency operations centre by the CSU, acting on the instructions of the policy and co-ordination group:

- a representative of the gendarmerie command staff,
- a representative of the police headquarters staff,
- a representative of the armed forces command staff
- a representative of the customs and excise board,
- a representative of the highways directorate,
- a representative of the Ministry of Transport,
- a representative of the technical services in the agricultural domain,
- a representative of the senior inspectorate of the fire service, and
- a representative of the district commissioners' offices for Luxembourg, Diekirch and Grevenmacher.

One representative each from the civil-defence service, the radiological safety division, the health board and the Ministry of the Interior shall be *ex officio* members of the executive group.

The representatives of the various authorities shall alert their respective administrations, which shall set up executive bodies.

The executive group shall designate additional authorities and services as necessary, particularly those referred to in item 5.1.3 below, to which the CSU must announce a red alert, advising them to prepare for possible intervention.

The executive group shall ensure that the CSU contacts the following establishments so that they can activate their internal emergency plans:

(e) the hospitals, retirement homes and nursing homes located in Luxembourg within a 25-km radius of Cattenom (see serial number 25 of the directory at subsection 5.11 below), as well as the prison, and

4 all industrial establishments situated within a 25-km radius and listed in subsection 5.11 below.

The CSU shall inform the aforementioned establishments that an accident has occurred at the Cattenom nuclear power station, that the general decision and co-ordination group has been convened and that the governing authorities of the hospitals and nursing homes must be alerted immediately.

3.1.0.1 The members of the civil-defence emergency task force shall occupy the premises of the emergency operations centre and shall form the CNA group there. The CNA group shall be placed under the authority of the radiological safety division. The role of the CNA group is to collate all the available radiological data in order to establish a picture of the general radiological situation.

3.1.0.2 The CNA group shall obtain from the radiological safety division the measurements from the network of permanent radioactivity-surveillance posts.

It shall also obtain meteorological data from the French emergency operations centre and from the meteorological service of the Luxembourg airport administration as well as the meteorological data from its own weather station. On the basis of these data, the CNA group shall assesses the radiological situation at regular intervals and report its findings to the policy and co-ordination group. The latter may instruct the CNA group to supplement and refine its information on the radiological situation by having the NBC teams take measurements and samples. To that end, the CNA group shall give the members of the NBC teams, which are based at the BNS in Lintgen, the necessary instructions on their itinerary and on the nature of the measurements and samples to be taken.

The radiological safety division shall produce advance plans, procedures and instructions in writing for the implementation of measures in the field and for sampling in the environment and in the food chain. These procedures shall be regularly practised in the field.

The CNA group is responsible for preparing information messages in accordance with European Community procedures for the purpose of rapid communication in the event of a radiological emergency. Once the messages have been checked by the general decision and co-ordination group, the CNA group is responsible for encoding and transmitting them as ECURIE messages. The same messages shall be addressed to the competent Belgian, French and German authorities and, if the relevant convention so requires, to the International Atomic Energy Agency in Vienna.

The CNA group shall ensure the application of the bilateral agreement between France and Luxembourg on exchanges of information in the event of an incident or accident with potential radiological consequences.

The general decision and co-ordination group shall designate a liaison officer, who shall report for duty at the emergency operations centre established in the prefecture in Metz.

3.1.0.3 On the basis of information received from the French emergency operations centre and from the CNA group, the general decision and co-ordination group shall undertake a general analysis of the situation. It shall prepare the decisions it deems necessary and submit them to the Government for approval. If need be, the policy and co-ordination group shall avail itself of representatives and experts from the various administrative bodies which belong to the executive group.

The general decision and co-ordination group shall keep the Government informed of the situation as it develops.

The public shall be informed by means of press conferences to be called by the press and information group; these shall be held in a room adjoining the emergency operations centre.

3.1.0.4 If the situation develops in such a way that contamination of the national territory seems likely, the general decision and co-ordination group shall take a decision to activate the measures prescribed for the general-alert phase.

3.1.1 Alert of the population

3.1.1.0 Initial phase

During the initial phase, if radioactive contamination of Luxembourg territory seems to be probable but not imminent, the general decision and co-ordination group shall determine which sectors or parts of sectors are at risk and shall instruct the CSU to activate the standby signal through the siren network; this will indicate to the public that they must listen to the national broadcasting stations.

The communal authorities shall ensure that inhabitants of hamlets and isolated buildings where the alarm signals are difficult or impossible to hear are alerted immediately through the fire brigade or by telephone, in accordance with their obligation laid down in the order circulated by the Minister of the Interior on 16 May 1985.

The communal authorities are also responsible for alerting any persons who are residing temporarily in their commune.

Public and private establishments shall exercise their responsibility for alerting their staff, guests and customers.

3.1.1.0.0 As soon as the standby signal is activated, the press and information group shall ensure that the national broadcasting stations broadcast several times the message reproduced in subsection 4.1 below enjoining the public to prepare for confinement in their homes and to collect their potassium iodide tablets from the places designated by the communal authorities and giving special instructions regarding schools.

3.1.1.0.1 The executive group shall give the following orders:

(a) It shall instruct the gendarmerie and the police

(f) to take whatever action is necessary to facilitate the flow of traffic caused by persons moving on their own initiative, as a precautionary measure, from the threatened sector or sectors to destinations of their choice.

(b) It shall instruct the civil-defence service

5 to equip the decontamination posts with the necessary facilities and supplies, an

6 to prepare one or more reception centres and to man them with first-aiders in case the population of certain localities should have to be evacuated (see subsection 5.6 below).

(c) It shall instruct the armed forces

7.0 to prepare and man the decontamination posts with suitably qualified personnel equipped with detection devices,

8.0 to prepare and man the Diekirch reception centre,

9.0 to prepare the means of transport that would be required if the population of particular localities had to be evacuated.

(d) It shall instruct Luxembourg Railways and all public and private transport companies

5 to stop traffic moving towards the alerted sectors.

(e) It shall instruct the waterways unit

- to stop river traffic moving up the Moselle in the event of the standby signal having been given in the eastern sector.

(f) It shall instruct the communal authorities concerned

- to undertake the distribution of potassium iodide tables if necessary.

(g) It shall instruct the agricultural authorities

- to organise the implementation of the preventive measures for the protection of foodstuffs, agricultural produce and livestock.

3.1.1.1. Intermediate phase

3.1.1.1.0 If the collected information seems to indicate that contamination of Luxembourg territory is imminent and that radiation dosages are likely to reach the thresholds laid down by the Government in accordance with item 3.0.3 above, the general decision and co-ordination group shall determine the sectors or parts of sectors where these dosages are likely to occur and shall instruct the CSU to activate the nuclear-alert signal in those areas by means of the siren network, indicating to the population concerned that they should take shelter in buildings and cellars.

Once the nuclear-alert signal has been activated, the policy and co-ordination group shall ensure that the national broadcasting stations broadcast several times the message reproduced in item 4.2.0 below enjoining the public to, remain in their homes. Similarly, the national broadcasting stations shall keep the confined population informed of the situation as it develops.

3.1.1.1.1 The sign-posting of the sectors or parts of sectors that are subject to confinement shall be effected by the highways administration, which shall erect road signs prohibiting access to the areas in question.

3.1.1.1.2 The gendarmerie and police shall undertake motorised patrols to enforce compliance with the prohibition of access to the confined sectors.

While the radioactive cloud is passing over, the personnel of the emergency teams shall also be confined indoors.

3.1.1.1.3 Once the radioactive cloud has passed over, if the personnel of the emergency teams and the vehicles they have been using leave the sectors which are subject to confinement, they must first proceed to a decontamination post, where they shall undergo contamination checks and shall, if necessary, be decontaminated.

3.1.1.1.4 Subject to prior approval by the Government, the standby and nuclear-alert states may be directly ordered by representatives of the civil-defence service and of the radiological safety unit if the initial analysis of the situation prescribed in point 3.1.0.0 above seems to indicate that contamination of Luxembourg territory is probable or imminent. In this case, all the other measures prescribed for the initial phase shall be taken immediately after the population has been alerted.

3.1.1.1.5 The end of the standby and nuclear-alert states shall be broadcast by the national broadcasting stations (see messages at 4.3.0 and 4.4.0 below).

3.2 Possible subsequent measures

3.2.0 Evacuation of the population

3.2.0.0 If the radiological situation as assessed by the CNA group is such that the population of particular localities seem likely to be subject to radiation dosages exceeding the thresholds laid down by the Government in accordance with item 3.0.3 above if they remain in those localities, evacuation shall be undertaken.

3.2.0.1 The sign-posting of the area to be evacuated shall be effected by the highways administration, which shall erect road signs prohibiting access to the area in question.

3.2.0.2 The general decision and co-ordination group shall ensure that the national broadcasting stations broadcast the message reproduced in item 4.5.0 below to the population of the localities to be evacuated.

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3.2.0.3 The general decision and co-ordination group shall give instructions for the creation of a mobile co-ordination group and shall designate its place of assembly. The task of the mobile co-ordination group shall be to organise the evacuation of persons who are unable to make their own way out of the localities to be evacuated. The group shall consist of one senior gendarmerie or police officer, to be designated by the gendarmerie and police command staff, of one representative of the highways administration, to be designated by the Director of Highways, of the head of the national civil-defence base, of two members of the CNA group to lead the NBC teams, of two officers of the armed forces, of the Chief Fire Inspector and, as required, the burgomasters of the communes concerned or their official representatives. The mobile co-ordination group shall be placed under the authority of the senior gendarmerie or police officer.

The following units and equipment shall be assigned to the mobile co-ordination group:

7 a detachment from the gendarmerie and police,
8 teams from the NBC group,
9 first-aid teams,
10 teams of fire-fighters,
11 the gendarmerie and police telecommunications vehicle, and
12 the civil-defence telecommunications vehicle.

The following supplies shall be taken to the place of assembly of the mobile co-ordination group:

- by the staff of the national civil-defence base: anti-dust outfits and potassium iodide tablets for the requirements of the emergency teams;
- by an NBC team: stocks of individual dosimeters prepared by the radiological safety division.

3.2.0.4 The evacuation shall be carried out by the following means:

- private vehicles,
- vehicles of the public transport service, and
- ambulances for sick and infirm persons.

3.2.0.5 The executive group shall mobilise the armed forces' transport pool as well as an appropriate number of buses belonging to the public and private companies referred to in subsection 5.8 below.

It shall also mobilise an appropriate number of ambulances to carry out the evacuation of sick and infirm persons.

So that the evacuation of the population can be organised efficiently, the armed forces' transport pool and the buses belonging to the public and private companies shall be driven to a place of assembly designated by the executive group.

The mobile co-ordination group shall give the emergency teams and all persons entrusted with the evacuation of the population precise instructions on the conduct to adopt in the area subject to evacuation in order to guarantee their own protection from irradiation.

3.2.0.6 The mobile co-ordination group shall assign to each locality an appropriate number of public-transport vehicles, which shall travel in a convoy accompanied by one or more ambulances and a gendarmerie or police vehicle equipped with a loudspeaker and linked to the mobile co-ordination group by radiotelephone.

3.2.0.7 The public-transport vehicles and the ambulances shall evacuate the persons concerned to reception centres equipped with a decontamination post, where they shall be decontaminated and accommodated temporarily.

3.2.0.8 The hospital patients in the localities to be evacuated shall be transferred by ambulance to hospitals in the part of the country that is unaffected by the accident. If there are insufficient beds in the country's hospitals, patients shall be transferred to hospitals outside Luxembourg.

3.2.0.9 After the evacuation and before the closure of the evacuated area, a patrol comprising a gendarmerie or police vehicle and a public-transport vehicle to pick up any persons who may still be inside the area shall be sent from the place of assembly in the direction of each evacuated locality. Once the patrols have completed their assignment, they shall report its results to the mobile co-ordination group. From that time on, the evacuated area shall be closed by the gendarmerie and police, and access to the area shall be subject to authorisation by the mobile co-ordination group.

3.2.0.10 Unless otherwise advised by the mobile co-ordination group, the gendarmerie and police may issue farmers with an access permit to, enable them to re-enter the evacuated area temporarily to feed and tend their livestock.

3.2.0.11 In order to avoid excessive contamination of livestock, the executive group shall mobilise livestock trucks and place them at the disposal of the mobile co-ordination group to accelerate and facilitate the evacuation of livestock (see subsection 5.9 below).

3.2.0.12 The members of the emergency teams shall perform their tasks wearing anti-dust gear and equipped with individual dosimeters, which shall be regularly

checked and exchanged by the radiological safety division. The personnel of the emergency teams shall be specially monitored.

3.2.0.13 The personnel of the emergency teams, as well as all the vehicles that have participated in the evacuation operations, must proceed to a decontamination post, where they shall undergo a contamination check and be decontaminated. This obligation shall not apply to either the emergency teams or the evacuated population if the evacuation takes place before the arrival of the radioactive cloud.

3.2.1 Personal decontamination at decontamination posts (see item 5.0.8 and subsection 5.7 below)

3.2.1.0 Decontamination posts shall be set up in a number of previously selected public buildings, which are equipped with showers. They shall be placed under the responsibility of the armed forces and shall be operated by military personnel, assisted by first-aiders from the civil-defence service, by fire-fighters and by physicians, whose task shall be to administer first aid.

3.2.1.1 All persons from localities where evacuation measures have been taken during or after the passage of the radioactive cloud shall be directed to decontamination posts before taking refuge in the homes of relatives or in the Diekirch and Ettelbruck reception centres. Emergency-team members who have been operating in a contaminated area shall likewise pass through a decontamination post at the end of their assignment.

3.2.2 Reception and accommodation of persons who have not found shelter by their own means

3.2.2.0 Persons who have not found shelter by their own means shall be registered, admitted and temporarily accommodated by the reception centres established in Diekirch and Ettelbruck. A decontamination post shall be set up inside each of the reception centres. The reception centres shall be equipped and managed by the armed forces and the civil-defence service, working in close co-operation.

3.2.2.1 From the reception centres, the evacuees shall be divided into three accommodation areas defined in the plan at subsection 5.5 below, namely:

- Area I: Echternach
- Area II: Ettelbruck-Diekirch-Vianden
- Area III: Wiltz-Clervaux

The accommodation capacities of each area, broken down by commune, are listed in subsection 5.5 below.

3.2.2.2 The executive group shall fix the quota of persons to be accommodated in each of the communes on the basis of the amount of accommodation available in each.

It shall inform the relevant burgomasters of these quotas and, at the suggestion of the latter, shall designate an assembly point in each commune for the evacuees who are to be accommodated there. It shall ask the evacuees

to take the necessary measures so that they can be allocated to the available hotels, inns, hostels, boarding schools, nursing homes, etc.

3.2.2.3 Before they leave the reception centre, the evacuees shall be informed of the commune and the assembly point where they will be taken into the care of the communal authorities.

3.3 Post-accident phase

3.3.0 Only the general decision and co-ordination group shall remain constituted during the post-accident phase.

Its task shall be to co-ordinate all matters relating to prevention and protection and to co-ordinate the efforts of the state services and authorities. The existing administrative structures shall be used to implement the various measures of prevention and protection or to resolve administrative or technical problems associated with the nuclear accident.

The radiological safety division of the Ministry of Health shall initiate a program of biological sampling and radioactivity measurements in the field and shall produce the most comprehensive account possible of the contamination of national territory.

On the basis of this account, provision may be made for additional measures of prevention and protection (see section 5 below).

3.3.0.0 In order to accelerate the process of returning the evacuated population to their homes, the fire service may be instructed to conduct decontamination operations by hosing down the roofs and facades of buildings as well as street surfaces.

3.3.1 Return of evacuated population to their homes

3.3.1.0 The process of returning the evacuated population to their homes shall be initiated once the level of radioactive fallout has decreased sufficiently and once the rainfall has improved the situation by washing away radioactive particles.

3.3.1.1 When the inhabitants of the evacuated localities are advised to return to their homes, it shall be recommended to them that they clean their dwellings and workplaces with a vacuum cleaner. The return of children and pregnant women to their homes may be delayed.

3.3.1.2 Detailed technical instructions on decontamination methods shall be provided by the authorities as required; these may extend to the decontamination of livestock, equipment, air filters, etc.

3.3.1.3 Detailed instructions shall be communicated to the public regarding temporary bans on the consumption of contaminated foodstuffs, such as vegetables, fruit, cereals, milk, etc. The same instructions shall provide guidelines for the use and industrial processing of these foodstuffs.

4. MESSAGES FOR BROADCASTING

The messages listed below should be regarded as models. They shall be revised and adapted as necessary before being broadcast.

4.0 Messages in the event of a blue alert

- 4.0.0 Blue alert: message in Luxembourgian
- 4.0.1 Blue alert: message in French
- 4.0.2 Blue alert: message in German
- 4.0.3 Blue alert: message in Portuguese
- 4.0.4 Blue alert: message in English
- 4.0.5 Blue alert: message for shipping

12.1 Messages in the event of a red alert

- 4.1.0 Message to, the population after the activation of the standby signal
  - 4.1.0.0 Red alert - initial phase: message in Luxembourgian
  - 4.1.0.1 Red alert - initial phase: message in French
  - 4.1.0.2 Red alert - initial phase: message in German
  - 4.1.0.3 Red alert - initial phase: message in Portuguese
  - 4.1.0.4 Red alert - initial phase: message in English

- 4.2.0 Message to the population after the activation of the nuclear-alert signal
  - 4.2.0.0 Red alert - intermediate phase: message in Luxembourgian
  - 4.2.0.1 Red alert - intermediate phase: message in French
  - 4.2.0.2 Red alert - intermediate phase: message in German
  - 4.2.0.3 Red alert - intermediate phase: message in Portuguese
  - 4.2.0.4 Red alert - intermediate phase: message in English

- 4.3.0 Message to, the population signalling the end of the standby
  - 4.3.0.0 Red alert - end of standby: message in Luxembourgian
  - 4.3.0.1 Red alert - end of standby: message in French
  - 4.3.0.2 Red alert - end of standby: message in German
  - 4.3.0.3 Red alert - end of standby: message in Portuguese
  - 4.3.0.4 Red alert - end of standby: message in English

- 4.4.0 Message to the population signalling the end of the nuclear alert
  - 4.4.0.0 Red alert - end of nuclear alert: message in Luxembourgian
  - 4.4.0.1 Red alert - end of nuclear alert: message in French
  - 4.4.0.2 Red alert - end of nuclear alert: message in German
  - 4.4.0.3 Red alert - end of nuclear alert: message in Portuguese
  - 4.4.0.4 Red alert - end of nuclear alert: message in English

- 4.5.0 Message to, the population in the event of evacuation
  - 4.5.0.0 Red alert - evacuation: message in Luxembourgian
  - 4.5.0.1 Red alert - evacuation: message in French
  - 4.5.0.2 Red alert - evacuation: message in German
  - 4.5.0.3 Red alert - evacuation: message in Portuguese
  - 4.5.0.4 Red alert - evacuation: message in English

Messages in the event of a blue alert

Message to the public,
to be broadcast several times by the national broadcasting stations
in the event of nuclear pollution of the waters of the Moselle

Annex II, item 4.0.4 (Blue alert)

English version

Notice to the public

Radioactive effluents from the Cattenom nuclear power plant have been accidentally released into the River Moselle.

This accident, however, does not constitute an immediate danger to the riverside residents.

As a precautionary measure, the public are nevertheless requested not to approach the riverbank. All contact with water or mud of the River Moselle should be avoided.

Fish from the River Moselle or from any pools or ponds, which are supplied directly or indirectly from the River. Moselle must not be eaten.

Water from the River Moselle must not be used for agricultural, viticultural or industrial purposes.

These instructions also apply to pools and ponds, which are supplied directly or indirectly by water from the River Moselle.

The Government is currently taking all necessary measures to ensure that these instructions are strictly enforced and that the situation is continuously monitored.

The public will be notified immediately of any changes in the situation.

Message to be conveyed:

- by the waterways unit of the Ministry of Transport to boatmen, boatwomen and lock operators,
- by the board of the management company of Mertert river port to docks staff and to companies and individuals working within the port precinct,
- by the highways administration to the river-bank and installation maintenance staff,
- by the board of Luxembourg Railways to the staff of the Wasserbillig and Mertert-Port railway stations and to the drivers of buses travelling alongside the Moselle.

Message to the public
Radioactive effluents from the Cattenom nuclear power plant have been accidentally released into the River Moselle. You are advised not to approach the riverbank and to avoid all contact with the water of the River Moselle

Messages in the event of a red alert

Message to the public,
to be broadcast several times by the national broadcasting stations
after the activation of the standby signal

Annex II, point 4.1.0.4 (Red alert - initial phase)

English version:

Notice to the public

Following an accident at the Cattenom nuclear power plant, there is a possibility that radioactivity may be released into the atmosphere within a period between a few hours and several days. This release of radioactivity could affect parts of our national territory.

Although there is no immediate danger to the population, the Government has, for precautionary reasons, put the following communes on standby alert: ..... .

The schools in the area on standby alert, i.e. the communes of .....,have been closed; the children attending these schools will be transported home by bus in the usual way.
People living in these communes are advised to go home from work and listen to the national broadcasting stations.

Message to the population

The following advice is given to the population of the alerted areas and communes:

- Collect potassium iodide tablets from the local council offices or from another designated place.
- Take pets indoors.
- Return home or stay close to stone, brick or concrete buildings so that you can take shelter in the event of a nuclear alert.
- Close all windows and doors tightly.
- Shut down all natural and artificial ventilation systems and air-conditioning systems with fresh-air intakes.
- Close all heater and chimney dampers.
- Place a layer of newspapers or damp cloths in the chinks of doors and windows to reduce the intake of air.
- Disconnect all rainwater-collection systems.
- Close all glasshouses.
- Cover kitchen gardens with plastic sheeting.

Farmers are advised to bring livestock into enclosed sheds, to prepare fodder and processed feed inside these areas and to cover open fodder silos with plastic sheeting.

The Government is monitoring the situation very closely as it develops and will keep the public informed continuously through the national broadcasting stations. You are therefore advised to keep your radio switched on and tuned to one of these stations for further instructions.

Message to the population,
to be broadcast several times by the national broadcasting stations
after the activation of the nuclear-alert signal

Annex II, point 4.2.0.4 (Red alert - intermediate phase)

English version

Message to the population

Following an accident at the Cattenom nuclear power plant, a release of radioactivity into the atmosphere is imminent. In view of the wind direction, radioactive contamination could affect parts of our national territory. The following communes have therefore been placed on nuclear alert: .....

The following advice is given to the population of these communes:

- Close all windows and doors tightly.
- Shut down all natural and artificial ventilation systems and air-conditioning systems with fresh-air intakes.
- Close all heater and chimney dampers.
- Place layers of newspapers or wet cloths in the chinks of doors and windows to reduce the rate of air exchange.
- Disconnect all rainwater-collection systems.
- Take refuge inside a building, cellar or other nearby shelter.
- Listen to the national broadcasting stations for further instructions from the authorities.
- Drink only tap water and eat only food from inside your home. From now on, the consumption of freshly harvested fruit and vegetables from outside is prohibited.
- Keep the potassium iodide tablets, but do not take them unless advised or instructed to do so in a message broadcast by the authorities.
- Use the telephone for emergencies only.

Houses and other buildings afford considerable protection against radioactive irradiation and contamination, so please remain calm and do not panic.

Entry to and movement in the affected area is prohibited, except for the emergency teams.

Radioactivity levels are being measured continuously.

The Government is monitoring the situation very closely as it develops.

You are advised to keep your radio switched on and tuned to one of the national broadcasting stations for further instructions.

Annex II, item 4.3.0 (Red alert - end of standby)

Message to the population,
to be broadcast several times by the national broadcasting stations,
signalling the end of the standby alert

Annex II, point 4.3.0.4 (Red alert - end of standby)

English version

Notice to the public

The French Government has informed the Luxembourg authorities that the accident which occurred at the Cattenom nuclear power plant is under control and that there is no longer any risk of radioactive irradiation of the population.

This information has been confirmed by continuous radiological measurements carried out by the national radiation-detection network.

Consequently, the Government hereby terminates the compulsory precautionary measures and announces the end of the standby alert.

Message to the population,
to be broadcast several times by the national broadcasting stations,
signalling the end of the nuclear alert

English version

Message to the population

The French Government has informed the Luxembourg authorities that all release of radioactive substances into the atmosphere caused by the nuclear accident at the Cattenom nuclear power plant has now ceased.

In view of the results of radiological measurements carried out by the national radiation-detection network, the Luxembourg Government has decided to end the sheltering of the population in all sectors and parts of sectors.

To protect yourself from residual contamination, you are asked to follow these instructions:

- Ventilate your house or flat and all other buildings for which you are responsible.
- Shower under running water, taking special care to wash hair thoroughly.
- Vacuum-clean your premises, then place the used dust-bag carefully into the dustbin; wash your hands immediately afterwards.
- Avoid contact with rainwater.
- Avoid contamination by rainwater.
- When outdoors, wear rubber boots, which are easily decontaminated.
- Remove footwear before entering living quarters.
- Refrain from outdoor-sporting activities.
- Keep children away from playgrounds.
- Keep away from woodland and forests.
- Do not hunt or fish; these activities are prohibited.
- Do no gardening.
- Do not use rainwater or surface water.
- Drain all tanks containing contaminated rainwater.
- Do not eat freshly harvested vegetables, fruit, etc., from a garden or farm, and do not drink fresh milk from a farm.

Farmers are advised to give their livestock uncontaminated feed and to refrain from working in the fields.

Message to the population,
to be broadcast several times by the national broadcasting stations
in the event of evacuation

Annex II, point 4.5.0.4 (Red alert - evacuation)

English version

Message to the population

Following the accident which occurred at the Cattenom nuclear power plant, the radiological situation is such that the population of ..... and ..... may be exposed to an irradiation dose exceeding the thresholds laid down by the Luxembourg Government if they remain in those localities.

To ensure the protection of the population of those localities, the Government has ordered their evacuation.

The inhabitants of the aforementioned localities are asked to leave these localities, if possible by their own means of transport. Those who do not have their own transport will be evacuated by public transport.

If you live in one of these localities, you are advised to do the following before leaving your place of residence:

- For each member of your family, pack a change of clothes, a change of footwear, toiletries and any necessary medication in a plastic bag and close it tightly.
- Take with you all important papers, such as family records, identity cards and social-security cards, as well as money and check books.
- Turn off water, gas and electricity.
- Close and lock all outside doors and windows.

If you are using your own means of transport, keep the windows closed and switch off the ventilation and air-conditioning system.

If you have been exposed to radioactive fallout, you will be required to proceed to a decontamination centre at ....., ... or ....., where you will be checked for contamination and, if necessary, decontaminated.

Unless you have relatives or friends who can accommodate you, on leaving the decontamination post you should proceed to one of the reception centres at Diekirch and Ettelbruck, where evacuees will be relocated and accommodation will be arranged for them in hotels, inns, hostels, etc. Vehicles used for the evacuation should be washed thoroughly.

Those persons who cannot leave their homes by their own means will initially be moved away from the danger area by public transport and taken to the Diekirch or Ettelbruck reception centre. The timetable for the evacuation of these persons will follow shortly.

Sick or disabled persons will be evacuated by ambulance. If you are sick or disabled, you should telephone your local authority or ask someone to telephone the local authority for you and hang a sheet from a front window of your house or flat.

Farmers must seek shelter outside the evacuated area but near enough to that area to enable them to re-enter it temporarily, subject to special authorisation, to feed and tend their livestock. To that end, special access permits for evacuated areas may be obtained from the police. Where there is a danger that livestock will be exposed to

harmful radiation, the authorities may order the removal of livestock from a contaminated area. If possible, the authorities will provide livestock trucks for that purpose.

In these difficult times, the Government is asking the public not to panic, to follow strictly the advice and instructions of the authorities and to offer their hospitality to evacuees in a spirit of true solidarity.

Except in a real emergency, you are asked not to call the national emergency operations centre on 112, since the centre will be very busy dealing with all the problems inherent in the evacuation, decontamination and accommodation of the inhabitants of endangered areas.

5.CONTENTS OF SECTION 5

5.0 Preventive and protective measures

5.0.0 Distribution of potassium iodide tablets to the population

Potassium iodide tablets shall be stored in the communes of Area One, where the communal authorities shall keep them ready for distribution to the population. Each commune shall be responsible for organising the distribution of tablets. To that end, each commune shall lay down internal procedures and designate the distribution points in advance. These internal procedures must be communicated to the competent district commissioner, who shall regularly check the provisions made by the communes.

The communal authorities shall also be responsible for distributing the potassium iodide tablets to hospital patients and residents of nursing homes, retirement homes, etc., in their commune.

An information brochure on preventive and protective measures, including directions for the use of potassium iodide tables, will be distributed to the population.

A reserve supply of tablets shall be available at the national support base of the civil-defence service. Directions for the use of the tablets are given at subsection 5.12 below.

5.0.1 Absorption of potassium iodide tablets

Preventive treatment against irradiation consists in absorbing stable potassium iodide, the effect of which is to reduce or prevent the absorption of iodine 131 and other radioactive isotopes of iodine.

Absorption of iodine by the thyroid gland is greater in children. The thyroid gland of a child is subject to an irradiation dosage roughly three times higher on average than that of an adult following the inhalation of iodine 131 and other radioactive isotopes of iodine.

It is imperative that the preventive use of stable iodine compounds should occur before radioactive iodine is inhaled or as soon as possible after

inhalation. The public must not take the tablets unless instructed to do so by the competent authorities.

If the potassium iodide tablets are taken within the first six hours following irradiation, the uptake of radioactive iodine into the thyroid gland is likely to be reduced by about 50%. If the tablets are taken more than 12 hours after irradiation, there will only be a small reduction. After 24 hours they are no longer effective.

The risks resulting from the administration of potassium iodide tablets should be less than those that might ensue from exposure to radiation. Undesirable side-effects may be experienced by a small percentage of the population.

(See directions for the use of potassium iodide tablets at subsection 5.12 below.)

5.0.2 Returning schoolchildren to their homes

All schools shall be equipped with battery- and mains-operated radios to enable the school staff to listen to instructions broadcast by the spoken media in the event of an alert.

These instructions shall refer to, the organised return of children to their homes or their temporary residence in the school buildings.

The implementation of these instructions shall be partly the responsibility of the public or private authorities (communes, Ministry of Transport, etc.) and partly the responsibility of the school teaching staff, who shall ensure in particular that the children are looked after until they leave the school.

5.0.3 Confinement

During the initial phase, confinement, i.e. sheltering the population inside buildings, is the most effective preventive and protective measure; it is simple to carry out, does not entail excessive health risks and is a means of reducing considerably the general level of irradiation during the passage of the radioactive cloud.

Confinement serves both to reduce the external irradiation of the population by the radioactive cloud by virtue of the screening effect of buildings and to reduce inhalation to a certain extent. Instead of evacuating a huge number of people before any radioactivity is released, it is preferable to confine the population and not to evacuate them until the radioactive cloud has passed over.

A lengthy preparation period is required to mobilise vehicles for an evacuation, and it might prove impossible to undertake the evacuation before the arrival of the radioactive cloud. It is imperative that evacuation should be avoided at all costs during the passage of the radioactive cloud, since it would expose evacuees to far higher dosages than if they had remained in the shelter of their homes.

It is recommended, however, that the length of confinement periods should be kept within acceptable limits.

5.0.4 Temporary reduction of natural and artificial ventilation in dwelling places

The reduction of natural and artificial ventilation is a very simple means of ensuring greater protection from internal irradiation caused by the inhalation of airborne particles when people are sheltering in their homes during the passage of the radioactive cloud. The main steps to be taken are as follows:

- closing all external windows and doors,
- shutting down all ventilation and air-conditioning systems,
- extinguishing heating stoves and open fires,
- closing all heater and chimney dampers, and
- placing a layer of newspapers or damp cloths in the chinks of doors and windows to reduce the intake of air.

5.0.5 Personal respiratory protection

Personal respiratory protection is a means of defence against radioactivity from particles suspended in the air or deposited on the ground. This protection can be provided by the use of handkerchiefs, of soft absorbent tissue paper, of clothing or other articles that can be used to cover the mouth and nostrils. This is a very simple way to reduce the inhalation dosage by about 90% during the passage of a radioactive cloud.

The public may be advised to use this method of protection when going to their place of shelter and even when sheltering there. Similar precautions may be recommended for use during the evacuation of a contaminated area.

Particular care must be taken when protecting the respiratory passages of new-born babies, infants and young children because of the danger of suffocation.

5.0.6 Use of protective clothing

Clothing does not afford protection from all irradiation, but it does protect the wearer from deposited radioactive particles. Any type of clothing will afford a certain degree of protection from radioactive contamination, on condition that the clothes are changed after the wearer has spent a certain amount of time out of doors or if the clothes have been exposed to radioactive rainfall.

5.0.7 Precautionary measures and personal hygiene

Some precautions and measures of personal hygiene will help to minimise the danger of absorbing radioactive substances and to prevent the contamination of people and dwelling places.
The main steps to be taken are as follows:

- totally avoiding contamination by rainwater,
- wearing rubber boots, which are easily decontaminated,
- removing contaminated footwear before entering living quarters,
- avoiding all other contamination in living quarters, and
- washing all exposed skin, taking special care to wash hair thoroughly.

5.0.8 Personal decontamination

Decontamination posts shall be set up in a number of previously selected public buildings. They shall be operated by military personnel, assisted by first-aiders from the civil-defence service, by fire-fighters and by physicians, whose task shall be to administer first aid.

All persons from localities where evacuation measures have been taken during or after the passage of the radioactive cloud shall be directed to decontamination posts before taking refuge in the homes of relatives or in the reception centres. Emergency-team members who have been operating in a contaminated area shall likewise pass through a decontamination post at the end of their assignment.

Where personal decontamination has been carried out as a protective measure in connection with confinement, it shall be carried out prior to confinement if

possible with a view to safeguarding places of shelter from radiological contamination.

5.0.9 Access control

It may become necessary to establish controls at entry points to a designated area very rapidly before and after a nuclear accident. The size of the controlled area may be altered as the situation develops.

The following are the main circumstances in which access control is warranted as a protective measure:

- during the initial phase of the accident, to prevent the unnecessary entry of additional persons into the danger area,

- during the initial and intermediate phases of the accident, to clear the access routes in order to make evacuation easier and to facilitate access to the affected areas by the emergency teams and the radiological inspection teams,

- during the final stages of the accident, once the radioactive cloud has passed over, to reduce unnecessary exposure caused by soil contamination and by the inhalation of radioactive substances that are suspended in the air again after having settled,

- in the wake of the evacuation process, to prevent unauthorised persons from re-entering the contaminated areas and to guarantee the safety of property left behind by the evacuees,

- during the final stages of the accident, to prevent the unauthorised transfer of contaminated equipment and products (foodstuffs, harvested crops, etc.) into uncontaminated areas, and

- during all phases of the accident to ensure that essential vehicles can move freely within the affected areas.

5.0.10 Restriction or suspension of certain open-air activities

Certain non-essential open-air activities must be restricted or prohibited in contaminated areas. These include:

- sporting activities,
- children's games,
- fishing,
- hunting,
- camping,
- gardening, and
- hiking, rambling and cycling for pleasure.

5.0.11 Evacuation

Evacuation is the ultimate protective measure and may be carried out in favourable circumstances.

As soon as a serious nuclear accident at Cattenom has been announced, a large percentage of the population may be expected to leave Area One on their own initiative and head for a destination of their choice. The gendarmerie and police shall take measures to facilitate the flow of traffic.

The evacuation of the remaining population may be ordered either before, during or after the passage of the radioactive cloud, and with due regard to the origin and course of the accident.

Evacuation before the passage of the radioactive cloud may be ordered if there is a time lag of at least several hours between the on-site accident and the expected release of the radioactive cloud and if the accident is liable to have serious consequences.

Evacuation during the passage of the radioactive cloud may be ordered if the radioactive emission is both of long duration and of high intensity and if the quantity of the radioactive fallout is such that the resultant irradiation would constitute a serious health hazard if the population were kept in the area.

Evacuation after the passage of the radioactive cloud may be ordered if, according to the results of the radioactivity measurements that have been taken, the quantity of radioactive fallout would constitute a serious health hazard if the population were kept in the area.

There is little likelihood that the entire population in any of the three sectors of Area One would have to be evacuated. Accordingly, the present plan provides for the possible evacuation of the population of high-exposure areas, especially those near the French border downwind of Cattenom.

In the highly unlikely event that the majority of the population had to be evacuated, the country would be confronted by a situation that it could not master with its own emergency resources. In that case, the Government would appeal for help to foreign countries, especially those with which it has concluded agreements on mutual assistance in the event of a disaster.

The Government must resort to evacuation if the danger is sufficiently great to warrant such action.

The following are among the factors on which the decision to evacuate shall depend:

- the extent and the characteristics of the accident,
- meteorological conditions,
- any other danger not relating to the nuclear accident.

5.0.12 Checking and protection of foodstuff, agricultural produce and livestock

During the three phases of a nuclear accident, a number of preventive or protective measures may be taken to contain or reduce the contamination of links in the food chain.

Provision may be made for the following measures:

during the initial phase:

- bringing livestock into sheds and byres,
- preventive evacuation of livestock,
- preventive slaughter of livestock,
- covering planted crops with plastic sheeting,
- covering silage stored in the open air with plastic sheeting,
- ensuring that glasshouses are kept closed,
- reducing as far as possible the natural and artificial ventilation of animal sheds and byres,
- early harvesting of vegetables, fruit and cereals, and
- disconnecting rainwater-collection systems.

during the intermediate phase, but not while the radioactive cloud is passing overhead:

- bringing livestock into sheds and byres,
- evacuating livestock,
- covering or re-covering planted crops with plastic sheeting,
- covering or re-covering silage stored in the open air with plastic sheeting,
- reducing as far as possible the natural and artificial ventilation of animal sheds and byres,
- delaying the harvesting of vegetables, fruit and cereals,
- refraining from the use of rainwater to water crops and livestock,
- using uncontaminated reserves of silage, and
- disconnecting rainwater-collection systems.

during the post-accident phase:

- evacuating livestock,
- delaying the harvesting of vegetables, fruit and cereals
- refraining from the use of rainwater to water crops and livestock,
- refraining from the use of surface water to water crops and livestock,
- using uncontaminated reserves of silage,
- destroying foodstuffs exceeding maximum admissible levels of radioactive contamination,
- decontaminating agricultural surfaces (see item 5.0.14 below),
- changing crops,
- changing harvesting methods,
- changing the diet of livestock prior to slaughter,
- draining tanks containing contaminated rainwater,
- using chemical fertilisers in place of organic manure,
- using special substances for the internal decontamination of livestock,

- processing contaminated foodstuffs into other products to reduce radioactivity to sufficiently low levels, and
- diluting and mixing contaminated foodstuffs with produce from uncontaminated areas.

Detailed procedures relating to preventive and protective measures in the agricultural domain shall be laid down by the competent units of the Ministry of Agriculture, Wine and Rural Development.

5.0.13 Restrictions on the use of foodstuffs

Foodstuffs originating in contaminated areas and intended for marketing and export shall be subject to radiological checks. To that end, representative samples shall be selected by the NBC teams. The competent technical authorities shall provide the radiological safety division with representative samples.

The regulations of the Council of the European Union and the European Commission establishing the maximum permissible levels of radioactive contamination for foodstuffs and animal feed after a nuclear accident or in any other radiological emergency.

5.0.14 Decontamination of property and of urban and agricultural surfaces

The decontamination of geographical areas, equipment, buildings, roads, land, etc., is a protective measure which essentially consists in transferring radioactive matter from one contaminated place to another place where they will cause less irradiation. Provision may be made for several such measures, in particular:

- washing road surfaces and the facades of buildings with fire-fighting appliances or industrial equipment,
- decontaminating children's play areas and replacing sand,
- decontaminating sports fields,
- decontaminating gutters and pavements,
- deep ploughing of agricultural land and pastures; this method does not eliminate contamination, but it does help to transfer radioactive fallout from the surface into the lower strata of the subsoil,
- skimming off and storing the top layer of soil,
- washing and scrubbing equipment and vehicles with water and appropriate detergents in contaminated areas,
- washing and scrubbing with water and appropriate detergents vehicles transferred out of contaminated areas, and
- using sprinklers to dampen radioactive dust so that it cannot be blown back into the ambient air.

5.0.15 Restrictions on the use of sewage sludge

After a nuclear accident, sewage sludge can become very highly contaminated. The use of this sludge as a fertiliser must be suspended. Contact with sewage sludge must be avoided. All personnel must be closely supervised when working with sewage sludge. Anyone working with sewage sludge is advised to

wear protective clothing. Time spent in the vicinity of the sludge must be kept to a minimum.

5.0.16 Replacement of air-conditioner filters, ventilator filters, etc.

The replacement of air-conditioner and ventilator filters is not an absolute priority. It is even preferable to let some time elapse before replacing the filters to allow the short-lived radio-nuclides to decay. The removal of these filters may pose irradiation and contamination problems for the personnel who have to replace them.

Prolonged contact with these filters must be avoided. Personnel working with these filters must be closely supervised. They shall be required to wear protective clothing and respiratory protection. Care must be taken during filter replacement to avoid raising dust particles that have settled.
A limit must be set on the time that may be spent in the vicinity of the filters.

5.0.17 Preparation of controlled areas for the storage of contaminated items

There must be suitable facilities for the storage of contaminated goods and products and for the storage of waste resulting from decontamination activities, especially sewage sludge, slag and cinders from incinerators, used air-conditioner filters, removed layers of topsoil, etc.

Personnel assigned to work in storage areas must be closely supervised. They shall be required to wear protective clothing and respiratory protection. Care must be taken during storage activities to, avoid raising dust particles that have settled. A limit must be set on the time that may be spent in the vicinity of storage areas.

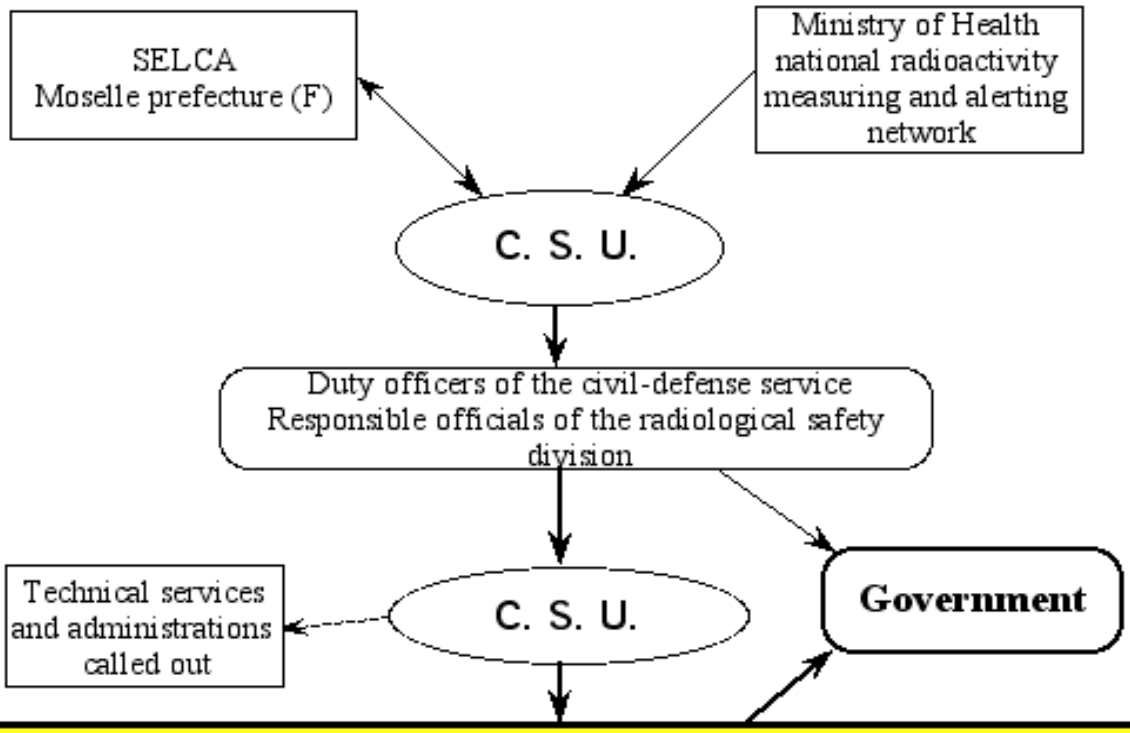
The environmental administration shall be responsible for the operation of these storage areas.

5.1 Procedures for announcing alerts

Callout plan

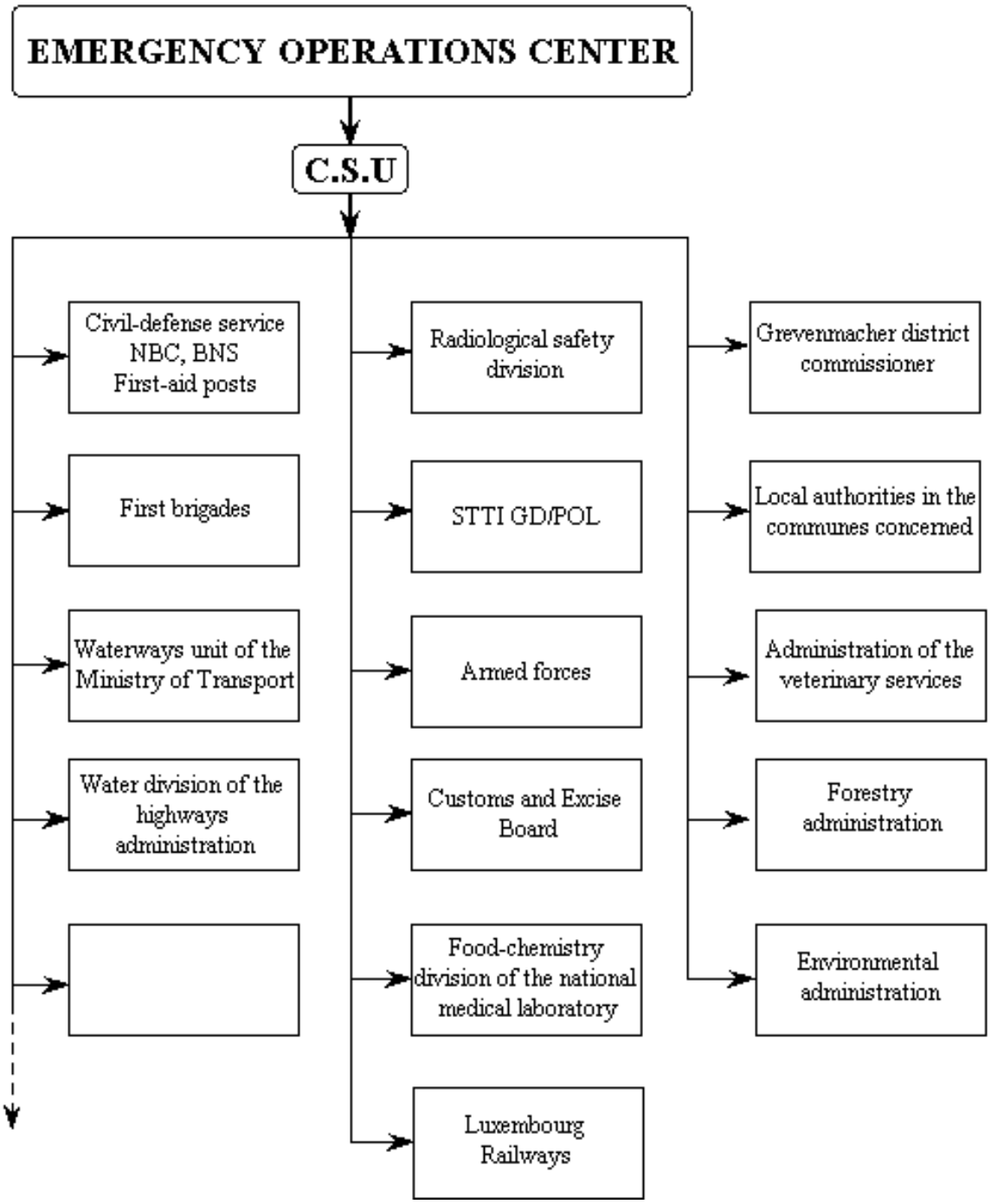
Annex II, item 5.1.1

BLUE ALERT

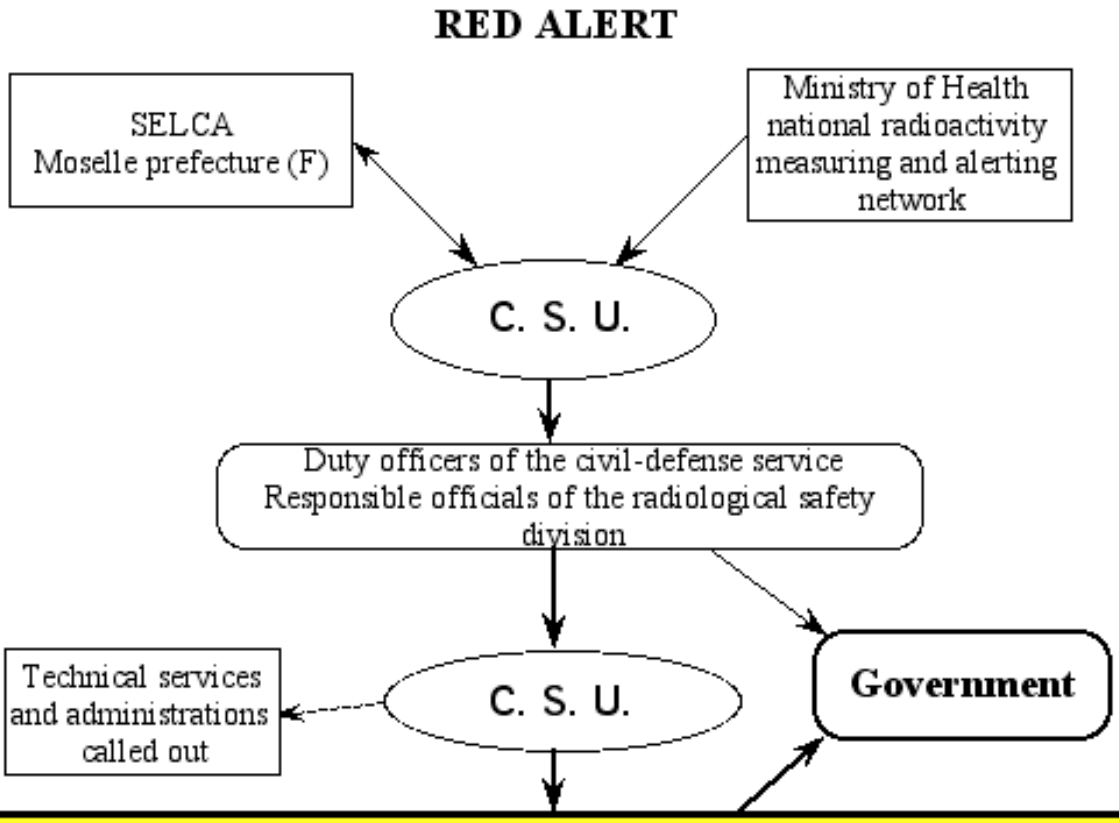


EMERGENCY OPERATIONS CENTER	
Decision and coordination group	- civil defence - radiological safety division - Ministry of the Interior - health board - others as required
Press and information group	- Government Press and Information Service - specialists
CNA group	- members of the emergency group
Executive group	- command staff of the gendarmerie - police headquarters staff - command staff of the armed forces - environmental administration - highways department, water division - Ministry of Transport, waterways unit - Grevenmacher district commissioner's office - national fire service - others as required

BLUE ALERT

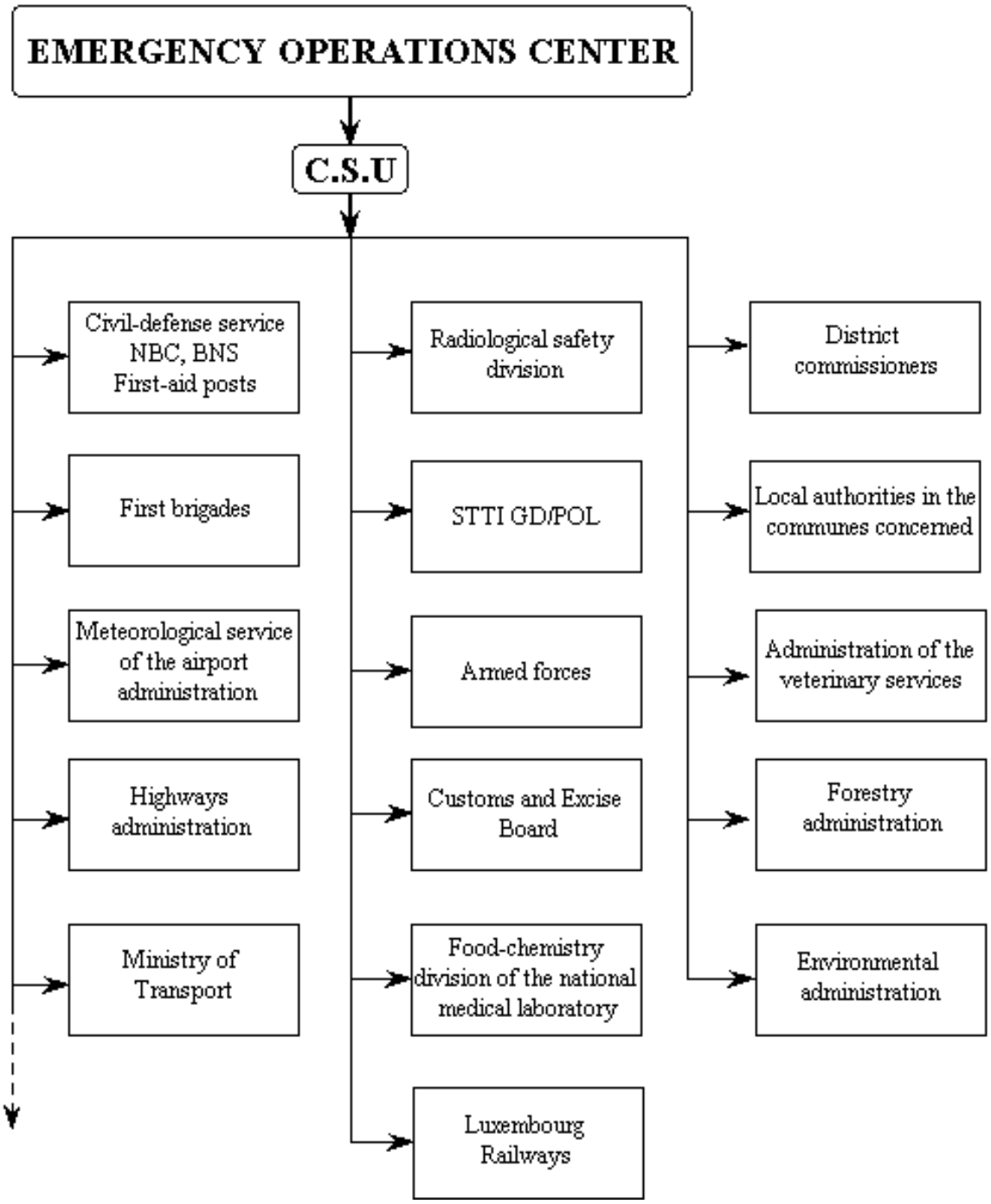

EMERGENCY OPERATIONS CENTER
C.S.U
Civil-defense service NBC, BNS First-aid posts
First brigades
Waterways unit of the Ministry of Transport
Water division of the highways administration
Radiological safety division
STTI GD/POL
Armed forces
Customs and Excise Board
Food-chemistry division of the national medical laboratory
Luxembourg Railways
Grevenmacher district commissioner
Local authorities in the communes concerned
Administration of the veterinary services
Forestry administration
Environmental administration

Callout plan Annex II, item 5.1.3



EMERGENCY OPERATIONS CENTER	
Decision and coordination group	- civil defence - radiological safety division - Ministry of the Interior - health board - others as required
Press and information group	- Government Press and Information Service - specialists
CNA group	- members of the emergency group
Executive group	- command staff of the gendarmerie - police headquarters staff - command staff of the armed forces - technical services, Ministry of Agriculture - Customs and Excise Board - highways department - Ministry of Transport - board of the national fire service - airport meteorological service - others as required

RED ALERT

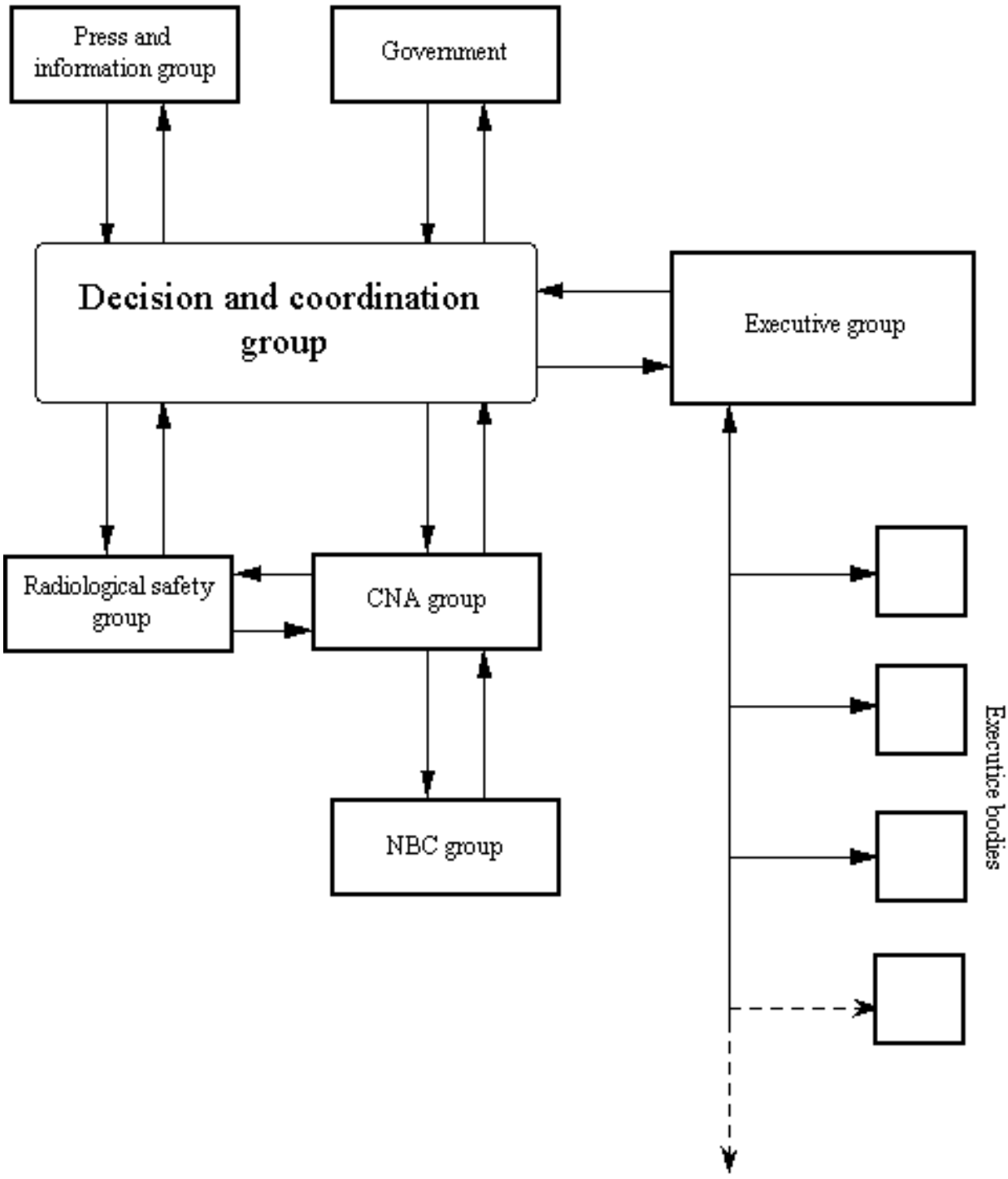

EMERGENCY OPERATIONS CENTER
C.S.U
Civil-defense service NBC, BNS First-aid posts
First brigades
Meteorological service of the airport administration
Highways administration
Ministry of Transport
Radiological safety division
STTI GD/POL
Armed forces
Customs and Excise Board
Food-chemistry division of the national medical laboratory
Luxembourg Railways
District commissioners
Local authorities in the communes concerned
Administration of the veterinary services
Forestry administration
Environmental administration

5.2 Organisation of the emergency operations centre

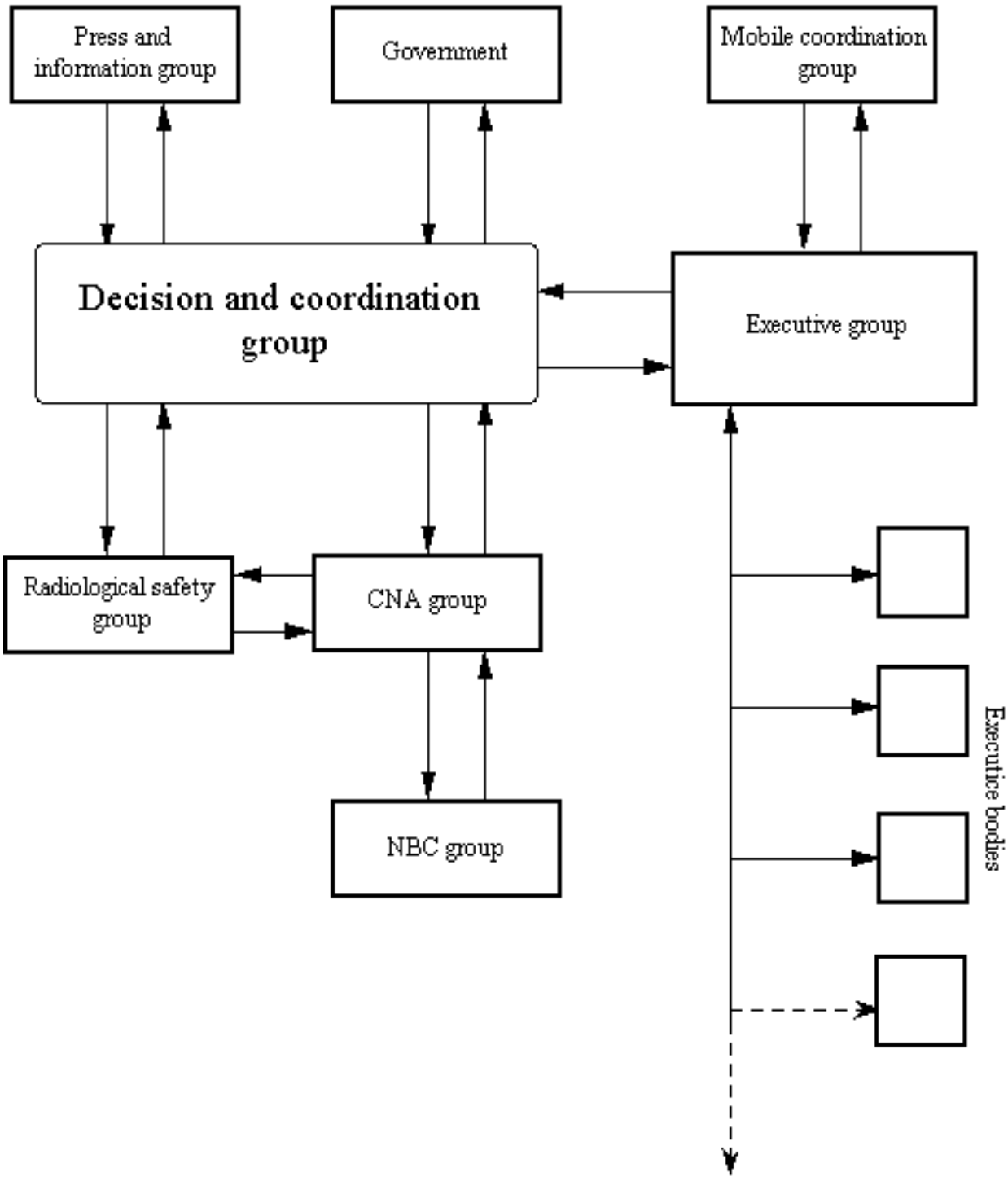
5.2.0 Organisation of the emergency operations centre in the event of a blue alert
5.2.1 Organisation of the emergency operations centre in the event of a red alert

Annex II. item 5.2.0

ORGANISTION OF THE EMERGENCY OPERATIONS CENTER IN THE EVENT OF A BLUE ALERT



ORGANISTION OF THE EMERGENCY OPERATIONS CENTER IN THE EVENT OF A BLUE ALERT



5.3 Population breakdown by civil-defence sectors (within a 25-km radius of Cattenom)

Eastern Sector

Communes	Localities	Population per locality	Population per commune
……..	……..	……..	……..
……..	……..	……..	……..
			Total for Eastern Sector

Central Sector

Communes	Localities	Population per locality	Population per commune
……..	……..	……..	……..
……..	……..	……..	……..
			Total for Central Sector

Western Sector

Communes	Localities	Population per locality	Population per commune
……..	……..	……..	……..
……..	……..	……..	……..
			Total for Western Sector

5.4 Traffic plan for the area within a 25-km radius of Cattenom

10.0 evacuation routes
6 routes reserved for emergency services
6 motorways
- roads closed to traffic in the direction of the affected area

5.5 Map of the accommodation areas containing the following details for each locality:

- number of hotels and beds,
- number of youth hostels and beds,
- number of hospitals and beds,
- number of schools and classrooms,
- number of boarding schools and beds.

5.6 Reception centres

	Accomodation for (number of evacuees)	Catering facilities for (number of evacuees)
- military property	……	……
- civil-defence service property	……	……
- secondary schools	……	……
- boarding establishments, etc	……	……
	Total: ……..	Total: ……..

5.7 Decontamination posts

Locations and buildings where personal decontamination is carried out, with the hourly decontamination capacity for each building.

5.8 Public and private transport companies

- Addresses with number of buses and total seating capacities

5.9 Livestock carriers

Addresses:

5.10 Telecommunications networks

5.10.0 Direct telephone connections
5.10.1 Civil-defence radiotelephone connections
5.10.2 Gendarmerie/police radiotelephone connections
5.10.3 Joint gendarmerie/police/civil-defence radiotelephone connections

5.11 Telephone directory

5.11.1 List of telephone, telex and fax numbers

Serial No	Administration, service, etc.
0	*List of telephone, telex and fax numbers*
1	Customs and excise administration
2	Forestry administration
3	Environmental administration
4	Highways administration
5	Veterinary service administration
6	Armed forces
7	Office of the District Commissioner for Diekirch
8	Office of the District Commissioner for Grevenmacher
9	Office of the District Commissioner for Luxembourg
10	Health directorate
11	Radiological safety division of the Ministry of Health
12	Gendarmerie (STTI GD/POL)
13	National Medical Laboratory - food-chemistry division
14	Ministry of Transport
15	Police (STTI GD/POL)
16	Mertert Port Management Company
17	Air-traffic control
18	Luxembourg Radio and Television Corporation (RTL)
19	Fire service
20	Press and information service
21	Meteorological service of the airport administration
22	Waterways service of the Ministry of Transport
23	Technical services of the Ministry of Agriculture
24	Luxembourg Railways
25	Hospitals and nursing homes within a 25-km radius of Cattenom nuclear power station
26	Arbed
27	Dupont of Nemours
28	Luxguard II

5.12 Directions for the use of potassium iodide tablets

Composition:

Each tablet contains 0.1 grams of potassium iodide.

Important:

The purpose of these potassium iodide tablets is to reduce the level of personal irradiation caused by the emission of radioactive iodide during nuclear accidents. They must not be taken except at the express request of the competent authority, because in the event of an accident the competent authority will be best able to make an informed assessment of the need and justification for the absorption of iodine.

Properties of the tablets and purpose of iodine absorption:

The potassium iodide tablets saturate the thyroid gland with iodine, thereby preventing the uptake of radioactive iodine into the thyroid gland.

The potassium iodide tablets are most effectively absorbed if they are taken shortly before the absorption of radioactive iodine or if they are taken within two hours of radioactive iodine being absorbed. Nevertheless, taking the tablets several hours after the ingestion or inhalation of the radioactive iodine will shorten the time it spends in the organism.

Iodine tablets are ineffective against the absorption of other radioactive substances by the human organism or against irradiation of external origin.

Side effects:

In general, the human organism will not react adversely to the absorption of iodine tablets. However, undesirable side effects (stomach pains) do sometimes occur. These generally disappear as soon as the individual stops taking the tablets. If these side effects persist, it is advisable to consult a physician.

Contraindications and risks:

Certain individuals display genuine hypersensitivity to iodine. These persons should not take iodine tablets.

Individuals who suffer from hyperactivity of the thyroid gland (hyperthyroidism) or those who experience disorders, especially of the nervous system, one to, three weeks after taking iodine tablets would be well advised to consult a physician.

Dosage:

- ***Adults (from the age of 13), including pregnant women****:* begin by taking two tablets, then take one tablet every eight hours until a total of ten tablets have been taken over a period of three to four days.

- ***Children (aged 6 to 12):*** begin by administering one tablet, then administer half a tablet every eight hours until a total of five tablets (one and eight halves) have been administered.

- ***Infants (aged 4 months to 5 years):*** administer half a tablet per day until a total of two tablets (four halves) has been administered.

The total number of tablets to be taken and the length of time over which they are to be taken may be increased on the orders of the competent authority.

Taking the tablets on an empty stomach is not recommended if at all avoidable. The tablets are more easily absorbed if swallowed with or dissolved in a drinkable liquid. Such solutions do not keep and should therefore be drunk without delay.

Note*:*

The tablets are to be stored away from direct sunlight and dampness. Tablets will only keep for longer periods if they remain sealed.

Dosage plan in the event of a nuclear accident:

	Adults (including pregnant women and children aged 13 or over	Children aged 6 to 12	Infants (4 months to 5 years of age)
Initial dose	2 tablets	1 tablet	day one: 1/2 tablet
8 hours later	1 tablet	1/2 tablet	day two: 1/2 tablet
8 hours later	1 tablet	1/2 tablet	day three: 1/2 tablet
8 hours later	1 tablet	1/2 tablet	day four: 1/2 tablet
8 hours later	1 tablet	1/2 tablet	
8 hours later	1 tablet	1/2 tablet	
8 hours later	1 tablet	1/2 tablet	
8 hours later	1 tablet	1/2 tablet	
8 hours later	1 tablet	1/2 tablet	
Total dosage	10 tablets	5 tablets	2 tablets

The tablets should preferably be taken with a liquid or dissolved in a liquid. Do not take them on an empty stomach.

5.13 Press and information group

A press and information group shall be established, comprising representatives of the Government Press and Information Service and other suitably qualified persons. This press and information group shall be the instrument through which the Government informs the public and conveys its decisions to them. The press and information group therefore has a special position within the present plan and special responsibility for its implementation.

The task of the press and information group shall be

- to communicate with the public at large and with the mass media on the basis of the special emergency plan, and
- to translate events and their development into publicly comprehensible news bulletins.

The press and information group shall be directly linked to the policy and co-ordination group.

In order to avoid the emergence of contradictory, incomplete and incoherent information, which would cause confusion among the population and make the special emergency plan unworkable and ineffective, only the press and information group shall be entitled to release information to the public concerning the nuclear accident.

The information released by the press and information group must scrupulously reflect the decisions taken by the Government.

The press and information group shall avail itself of suitably qualified experts in particular subject areas to provide specific explanations.

The press shall be briefed by the following means:

- During the initial and intermediate phases, if the time lag between the official announcement of the accident and the implementation of the preventive measures is short, the press and information group shall broadcast its messages direct over the airwaves of the national broadcasting stations, which shall have made them available to the emergency operations centre.

- During the initial and intermediate phases, if the time lag between the official announcement of the accident and the implementation of the preventive measures is sufficiently long, as well as during the post-accident phase, the press shall be briefed by means of press conferences held near the emergency operations centre.

5.14 Informing the public

The public shall be alerted during the initial and intermediate phases by the civil-defence alarm sirens. The public shall be informed by means of the press, radio and television, news bulletins and press conferences (see subsection 5.13 above).

The press and information group shall implement and ensure compliance with the provisions of the Council Directive of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency.

The information given to the public must be precise, clear, logical, accurate and up to date and must leave no room for doubt or confusion.

The information given to the general public must be repeated at regular intervals.

The information given to the public shall relate to the following points in particular:

- the origin of the accident,
- the presumed or established extent of the accident,
- the foreseeable or actual course of the accident,
- the potential consequences of the accident,
- the use of potassium iodide tablets
- the distribution points for potassium iodide tablets in the various communes,
- preventive and protective orders,
- measures to be taken in the event of confinement or evacuation,
- recommendations on action to be taken to facilitate the implementation of the special emergency plan, and,
- if sufficient time is available, the basic principles of radioactivity and its effect on the human organism.

The messages broadcast to the general public must be structured as follows:

- a description of the present situation,
- the probable development of the situation,
- the official assessment of the situation, and
- recommendations, which must include information relating to
    - preventive and protective measures,
    - the geographical areas affected,

- the date of entry into force of each measure, and
- the resources deployed by the Government.

It may prove necessary to provide specific information for particular sections of the population or members of particular occupational groups, such as

- members of emergency teams,
- farmers,
- medical practitioners and paramedics,
- workers responsible for maintaining ventilation and filtration systems,
- workers who are required to re-enter highly contaminated areas,
- staff of sewage treatment works,
- etc.

5.15 Requisitioning Act and implementing regulations

5.16 Regulations, conventions, agreements, directives and arrangements relating to radiological emergencies

- Requisitioning (Armed Conflicts, International Crises and Disasters) Act of 8 December 1981

- Regulation of 22 January 1991 implementing Article 16 of the Requisitioning (Armed Conflicts, International Crises and Disasters) Act of 8 December 1981

- Regulation of 22 January 1991 implementing Article 18 of the Requisitioning (Armed Conflicts, International Crises and Disasters) Act of 8 December 1981

- Civil Defence Organisation Act of 18 November 1976, as amended by the Act of 11 January 1990

- Ratification Act of 16 June 1976 to the Agreement signed on 23 July 1970 between the Government of the Grand Duchy of Luxembourg and the Government of the Kingdom of Belgium on Mutual Assistance in Matters of Civil Defence

- Agreement, signed on 13 May 1993, between the Government of the Grand Duchy of Luxembourg and the Government of the Kingdom of Belgium on Mutual Assistance in Matters of Civil Defence

- Agreement, signed on 10 December 1962 and promulgated on 7 February 1963, between the Government of the Grand Duchy of Luxembourg and the Government of the French Republic on Mutual Assistance between the Luxembourg and French Fire and Emergency Services

- Detailed Rules of Application for the Franco-Luxembourg Agreement of 10 December 1962 on Mutual Assistance (27 August 1975)

- Agreement, signed on 11 April 1983, between the Government of the Grand Duchy of Luxembourg and the Government of the French Republic on Exchanges of Information in the Event of an Incident or Accident with Potential Radiological Consequences

- Agreement, signed on 2 March 1978 and ratified by the Act of 29 April 1980, between the Grand Duchy of Luxembourg and the Federal Republic of Germany on Mutual Assistance in the Event of Disasters or Serious Accidents

- Agreement, signed on 29 March 1994, between the Government of the French Republic and the Government of the Grand Duchy of Luxembourg concerning the Establishment of a Radioactivity Measuring Station and the Organisation of Bilateral Co-operation in the Domain of Nuclear Safety

- Administrative Arrangement, signed on 12 May 1987, between the Ministry of the Interior of the Grand Duchy of Luxembourg and the Federal Ministry of the Interior of the Federal Republic of Germany concerning the implementation of the Agreement of 2 March 1978 between the Grand Duchy of Luxembourg and the Federal Republic of Germany on Mutual Assistance in the Event of Disasters or Serious Accidents

- Convention on Rapid Notification of Nuclear Incidents, adopted in Vienna on 26 September 1986 by the special session of the General Conference of the International Atomic Energy Agency

- Convention on Nuclear Safety, adopted by the Diplomatic Conference of the International Atomic Energy Agency at its session of 14-17 June 1994

- Council Decision No 87/600/Euratom of 14 December 1987 on Community arrangements for the early exchange of information in the event of a radiological emergency

- Council Regulation No 87/3954/Euratorn of 22 December 1987 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feeding-stuffs following a nuclear accident or any other case of nuclear emergency

- Council Regulation No 89/2218/Euratom of 18 July 1989 amending Council Regulation No 87/3954/Euratorn of 22 December 1987 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feedingstuffs following a nuclear accident or any other case of nuclear emergency

- Commission Regulation No 87/944/Euratorn of 12 April 1989 laying down maximum permitted levels of radioactive contamination in minor foodstuff following a nuclear accident or any other case of nuclear emergency

- Council Regulation No 89/2219/EEC of 18 July 1989 on the special conditions for exporting foodstuffs and feeding-stuffs following a nuclear accident or any other case of nuclear emergency

- Council Directive No 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency

- Commission Regulation No 90/770/Euratom of 29 March 1990 laying down maximum permitted levels of radioactive contamination of feeding-stuffs following a nuclear accident or any other case of nuclear emergency

- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

5.17 Basic structure of the International Nuclear Events Scale (INES)

SAFETY-RELATED CRITERIA

Annex III

Alarm signals emitted by the civil-defence sirens

Standby

Warbling tone continuing for one minute	Listen to the radio and follow the instructions given by the authorities

Nuclear alert

Warbling tone continuing for one minute, Interrupted by two twelve- second pauses	Take shelter in buildings and cellars

All-clear signal

Steady tone continuing for one minute	Danger over

Fire alarm

Steady tone continuing for three minutes