COMMISSION OF THE EUROPEAN COMMUNITIES

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REPORT ON ACTIVITIES UNDERTAKEN BY THE COMMUNITY
FOLLOWING THE CHERNOBYL ACCIDENT

REPORT FROM THE COMMISSION

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EXECUTIVE SUMMARY

1. Following the Chernobyl accident, the Commission adopted a programme of work in the fields of health, the safety of installations and research. The activities have since then continued and the current situation is as follows.

2. One of the priorities was to establish a regulatory system laying down maximum permitted levels of radioactivity in foodstuffs.

   The provisions currently in force following the Chernobyl accident are set out in Council Regulation 3955/87 of 22 December 1987, which supplemented and adjusted the regulations adopted hitherto. This Regulation will remain in force until the end of December 1989.

   The system that will be applicable in case of future accidents is laid down by Regulation 3954/87 of 22 December 1987, which provides that, in the event of an accident, the Commission may impose predetermined maximum permitted contamination levels. This emergency action may then be adjusted according to the exact nature and scope of the incident concerned.

   The regulation 3954/87 needs to be supplemented in some respects as it does not lay down specific predetermined values for certain categories of foods. With regard to baby foods and liquid foods, the Commission sent to the Council in June 1988 a supplementary proposal which is currently before the Council. Also, the Commission, after having examined with the Group of Experts established by the Euratom Treaty the results of a scientific seminar on radioactivity in foodstuffs, has recently sent to the Council a communication on this subject. Last, the Commission has also called an ad hoc group of experts to evaluate the basis for a proposal on minor foodstuffs to be adopted by committee procedure.

   At the request of the Council, the Commission has furthermore submitted a proposal for a Council regulation prohibiting the export of foodstuffs with a contamination level exceeding the maximum levels permissible within the Community. The proposal is currently before the Council.

   When it is complete, the Community regulatory system setting the maximum permitted levels of radioactivity in foodstuffs will be a coherent instrument in which the shortcomings which appeared after the Chernobyl accident will have been corrected.

3. Major progress has also been made in the setting up of systems for the rapid exchange of information following a nuclear accident, both at world and at Community level.

   In September 1986, an international convention on this subject was adopted by the General Conference of the IAEA and rapidly brought into force. In December 1987 the Council decided that the Community would accede to the convention. However, the Decision cannot be implemented until the Member States have notified the Commission that the convention has become applicable in conformity with the provisions of their national law. The delay will not have any practical consequences as the Commission will state to the IAEA its intention to act in accordance with the convention as soon as the procedure concerning the notification of a possible accident in an establishment of the Joint Research Center (CCR) has been completed together with the Member States concerned.

   The Commission has taken the view that the international convention falls short of fully covering the information exchange needs within the Community. On a proposal from the Commission, the Council therefore adopted the Decision 87/600 on Community arrangements for the exchange of information in the event of a nuclear accident. These arrangements extend the conditions of application, specify the triggering mechanism, expand on the information to be provided and guarantee that the information received will be sent to all Member States, while remaining compatible with the system laid down in the international convention. Appropriate steps have been taken to render the system operational immediately.

4. In view of the existence of the JRC, the Commission has also advocated the Community's accession the International Convention on Assistance in the case of a Nuclear Accident, which was also adopted in September 1988. The proposal was submitted to the Council in January 1987, but no decision has yet been taken.

   At Community level, the Commission has consulted Member States' experts on the possible areas where additional Community cooperation might be worthwhile. The approach and the areas of cooperation identified are similar to those used as a basis for conventional civil protection and the Commission will be reporting to the Council on this subject shortly.

5. The Commission's activities with regard to the provision of information have taken place at several different levels.

In the regulatory field, the Commission has put forward a proposal for a Council directive on the provision of information to the public which places a two-fold obligation on the Member States to provide information:

- first, the groups at risk of being affected by an accident should be provided with information on a permanent basis as regards radioactivity in general and the protection measures applicable to them;
- second, in the actual event of an emergency, the groups concerned should receive information about the measures taken and the action they should take.

There have also been a number of activities to support the national authorities. Firstly, the Commission held the first meeting of the Standing Conference on Health and Safety in the Nuclear Age, the aim being to provide the public, via the media, with objective information about the hazards of ionizing radiation from all sources. This was the first Community-level meeting at which all groups concerned were able to exchange their views and experience. Secondly the Commission is continuing to produce audiovisual modules on radiation protection and has started to prepare information brochures for the public. Finally, specific seminars for workers' representatives and scientists have been held.

6. The specific activities agreed following the Chernobyl accident should not obscure the routine activities which form part of the implementation and ongoing adaptation by the Community of the basic standards for the health protection of the general public and workers against the dangers of ionizing radiation. The most recent versions of these standards are the object of two Council directives of 1980 and 1984. The Commission has had to take steps against several Member States to expedite the transposition into national legislation of the provisions laid down in the directives.

The Commission, with the support of the group of experts provided for in Article 31 of the Euratom Treaty and the research programme in the field of radiation protection, is following scientific developments in this area. It has in particular instructed the group of experts to assess the possible need for adjustment of the basic standards as a result of the ongoing work within the International Commission on Radiological Protection (ICRP) and The United Nations Scientific Committee on the Effects of Atomic Radiations (UNSCEAR).

7. The Commission has taken other measures related to the monitoring and evaluation of the environmental effects of radioactivity.

   In the 1960s, the Commission exercised its right, under Article 35 of the Euratom Treaty, to inspect facilities for monitoring the level of radioactivity in the environment. On 4 June 1987 it wrote to the Member States to obtain the agreements required to exercise this right once again.

   In 1986, the Commission started to publish in the Official Journal opinions delivered under Article 37 Euratom concerning plans for the discharge of radioactive effluents.

   It also plans to publish in the course of 1989 a report on the actual discharges of effluents from nuclear power stations and reprocessing plants between 1977 and 1986, and a report on the levels of radioactivity in the environment from 1984 to 1986.

   At the scientific level, the Commission has developed a data bank named REM (Radioactivity Environmental Monitoring) containing more than 300,000 data on radioactivity in the environment, agricultural products and foodstuffs.

8. With regard to safety of nuclear installations and more specifically to the technical-regulatory aspects, the Commission detailed the activities it performs within the framework of the Council Resolution of 22 July 1975 in a report addressed to the Council.

In recently adopted conclusions, the Council shares the Commission's view that the 1975 Resolution should continue to provide the framework for the development of a harmonized approach at Community level.

The strategy advocated by the Commission can be implemented using existing cooperation structures and mechanisms and consists of four elements:

- to draw provisional conclusions from the harmonization process undertaken within the Community by publishing the main criteria for reactor safety. This will be published shortly;
- to promote cooperation on safety analyses performed at the national level;
- to prepare an inventory of the on-going projects, human resources and main installations devoted to research and development in nuclear safety;
- to support the IAEA in its international activities.

9. As far as research is concerned, the Council on 21 December 1987 adopted a revision of the radiation protection programme (1985-1989) which takes account of the impact of the Chernobyl accident. The research projects have two aims: to improve the evaluation of the radiological effects of nuclear accidents and to strengthen the plans and protection measures to be implemented in the event of any future accidents.

   The JRC research programme for 1988-1991 definitively approved on 14 October 1988 also takes account of the Chernobyl accident in the nuclear reactor safety and radioactivity environmental monitoring activities.

   A proposal for a shared cost research programme in the field of remote handling in nuclear hazardous and disordered environments (TELEMAN) has been submitted by the Council. Certain aspects of this programme concern the mangement of nuclear accident.

1. INTRODUCTION

After the Chernobyl accident the Commission undertook a work programme whose features were outlined in the framework communication on the consequences of the Chernobyl accident (1) and in the communication on the development of Community measures for the application of chapter III of the Euratom Treaty (2).This work programme's objective was to reinforce and where appropriate to complete the instruments available to the Community in the areas of health protection against the dangers of ionizing radiations, technological safety of installations and nuclear safety research.

The actions have been continued until now, and this report presents a detailed description of the situation for each of the subject areas concerned. The report takes account of the specific activities initiated after the accident as well as of the permanent activities which were enlarged, reoriented or just updated after the Chernobyl accident. In the area of research, the present report only quotes those activities directly connected with the Chernobyl accident.

2 RADIOACTIVE CONTAMINATION OF FOODSTUFFS

One of the priority actions undertaken was to establish a regulatory system laying down maximum permitted levels of radioactivity in foodstuffs.

The radioactivity which was deposited in varying amounts over the surface of Europe following the Chernobyl accident on 26 April 1986 contaminated a wide range of agricultural products. Plants were contaminated by direct deposits of radionuclides upon their surface. Animal products - dairy produce, meat, etc. - were contaminated through animal consumption of contaminated grass, etc. Contaminated agricultural products which are used for human consumption became vehicles for exposure of man to radioactivity. In view of the potential danger in this situation the Community system for rapid alert in cases of food contamination was put into effect on 2 May 1986 and data or food contamination were exchanged on a daily basis between control authorities. Concern over foodstuffs from contaminated areas, and especially imports from the Soviet Union and other affected Eastern European countries, led to the imposition by national authorities of restrictions on internal trade and on imports.

1) COM (86) 327 Final
2) COM (86) 434 Final

The national experts on food contamination met on 5 May 1986 together with experts in trade and in radiation protection and on the basis of this consultation the Commission:

- adopted on 6 May a Recommendation based on the EEC Treaty (1) calling on Member States to set certain maximum levels for radioactivty in milk, in milk products, and in fruit and vegetables; these limits were designed to deal with the immediate hazard which arose from Iodine-131;

- proposed on 6 May a Council regulation based on the EEC Treaty temporarily suspending the import of some agricultural products from the Soviet Union and other affected Eastern European countries. The Council regulation was adopted on 12 May (2)

- adopted on 7 May an analogous decision concerning other foodstuffs for which the intervention of the Council was not required (3)

At the same time, the Member States agreed not to impose on imports from within the Community stricter radioactivity levels than those pertaining to home products.

Both the Commission Decision and Council Regulation remained valid until the end of May 1986.

The objective of these actions was to preserve the unity of the Common Market and to prevent distortions of trade within the Community while protecting the health of the population.

Subsequently, the alert system continued to operate and a number of meetings of experts were held to update the situation and to consider the hazard arising from radionuclides other than Iodine-131.

1) Commission Recommendation of 6.5.86, OJ L118 of 7.5.86
2) Council Regulation EEC nr 1388/86 OJ L 120 of 8.5.86
3) Commission Decision of 6/4.5.86, OJ L120 of 8.5.86

Following discussions with Member States, urgent advice was sought from the Group of experts appointed to advise the Commission in drawing up the Euratom Basic Safety Standards under the terms of Article 31 of the Euratom Treaty. On 23rd May this Group recommended a provisional limit for caesium isotopes and a working party within the Group was set up to consider the whole question of limits applicable to radioactive contamination of foodstuffs following an accident. The provisional limit was specific to the Chernobyl case, in that it took into account the fact that all forms of radioactive materials other than those of caesium were, following the natural decay of Iodine-131, of little relative importance in terms of the risk to health via foodstuffs.

These consultations were the basis for the Council regulation 1707/86 adopted on 30 May 1986 which replaces the previous import ban and fixes the maximum levels of caesium 134 and 137 contamination in foodstuffs (1). The regulation imposed a limit of 370 Bq/kg to milk products and infant foodstuffs and 600 Bq/kg to all other foodstuffs; while the Regulation per se applied only to imports into the Community it was agreed that no lower limits would be applied by any Member State as regards intra-Community trade. Furthermore it was also agreed not to impose on imports from within the Community stricter limits than those pertaining to home products. A Commission Regulation of 5 June 1986 (2) defines the necessary controls.

The Council Regulation 1707/86 was valid until 30 September 1986, and the Commission was invited to present forthwith detailed and comprehensive proposals, based on the Euratom Treaty and in particular Article 31 thereof, which would seek to establish a permanent system of limitation on foodstuffs contamination following an accident and which would complement the provisions of the Council directive laying down the basic safety standards for the health protection of the general public and workers against the dangers of ionizing radiation.

The Council regulation was successively extended (3) until 30 December 1989.

1) Council Regulation EEC n° 1707/86 L146, 31.5.1986
2) Commission Regulation EEC No 1762/86, OJ L152, 6.6.1986
3) Council Regulations EEC n° 3029/86, OJ N° L280, 1.10.1986,
n° 624/87, OJ L58, 28.2.1987
n° 3955/87, OJ n° L371, 30.12.1987,

During the period since Chernobyl the Commission's services have had bilateral contacts with over 30 third countries in respect of specific problems relating to radioactivity levels in exports of Community products or limits and control procedures applied by third countries. Several missions were undertaken, in particular to Far Eastern countries where limits and procedures were particularly severe. It is notable that fifteen of our major trading partners in the food and agricultural produce sector, including the USSR, adopted limits identical or similar to those applied to imports by the Community. The Commission is currently engaged in discussions with various countries to suspend or reduce systematic controls on radioactivity in foods in trade which are now unnecessary.

The import limits applied by the Community in Regulation 1707/86 have also been integrated into contracts for the supply of food aid to third countries.

In parallel the Commission continued its work to arrive at a permanent system concerning maximum permitted radioactivity levels for foodstuffs in the event of a nuclear accident.

In January 1987 the Commission, having taken into account a recommendation produced by the Article 31 Group of experts, presented a preliminary proposal for a system which does not contain fixed permanent limits but instead provides for ad hoc limits to be laid down in the light of the circumstances resulting from any particular accident and as such it defines a decision making procedure to establish such limits as a matter of urgency following an accident (1).

In preparing this communication the Commission took into account the advice of an ad hoc "Committee of High Level Independent Scientists" set up to assess the status of radiation protection in relation with the consequences of nuclear accidents.(2)

The draft Proposal for a Council Regulation annexed to the Commission Communication of 23 January 1987 was considered by the Economic and Social Committee which issued a preliminary opinion on the proposal on 13 May 1987 (3). The Council has also given preliminary consideration to the draft Commission proposal.

1) COM (87) 28 final
2) EUR 11449
3) OJ C 180 of 8.7.87

To complete its draft proposal the Commission organized an International Scientific Seminar on Foodstuffs Intervention Levels following a Nuclear Accident in April 1987 in Luxembourg. The Seminar brought together some 100 radiation protection experts from 27 countries and representatives from five international organisations, i.e. World Health Organization (WHO), International Commission on Radiological Protection (ICRP), United Nations Food and Agriculture Organization (FAO), Nuclear Energy Agency of the Organization for Economic Cooperation and Development (NEA), and International Atomic Energy Agency (IAEA).

The aim of the Seminar was to seek international consensus on intervention levels for the contamination of foodstuffs following a nuclear accident and on the methods for deriving such levels. The Seminar proved extremely useful in that it allowed a worldwide exchange of information and views on foodstuff intervention levels: moreover, a consensus on a series of basic principles for the derivation of such levels was obtained; however, it became equally clear that there was a wide range of views among the scientists present on precise foodstuff contamination levels. After this seminar the Article 31 Group of Experts revised its previous recommendations.

Following these consultations, the Commission submitted to the Council its proposal for a Regulation (2) on 16 June 1987. The proposal is based on the advice of the Article 31 Group of Experts; however, some numerical values were modified in order to take into account considerations other than purely radiological.

The Council dedicated several sessions to this subject and a Council regulation laying down maximum permitted levels of radioactive contamination of foodstuffs and of feedingstuffs following a nuclear accident or any other case of radiological emergency was finally adopted on 22.December.1987 (3).

The adopted regulation is incomplete in that it does not contain limits concerning baby foods, liquid foodstuffs, minor foodstuffs and feedingstuffs, for which supplementary work was undertaken.

1) EUR 11232
(2) OJ C174 of 2.7.1987
(3) OJ L371 of 30.12.1987

After having obtained the advice of the Group of experts of article 31 the Commission submitted to the Council in June 1988 a Communication (1) aiming at completing regulation 3954/87 about baby foods and liquid foodstuffs. Furthermore, the Commission, after having obtained the advice of the group of experts of article 31 on feedingstuffs, which was given in the light of the results of a scientific seminar organized by the Commission in September 1988, recently submitted to the Council a Communication on this subject (2)

With regard to minor foodstuffs, the Commission has convened a group of experts in the field of food technology and contamination in order to assess the base for a proposal for adoption by committee procedure.

At the time of the adoption of regulation 3954/87 the Council adopted a resolution (3) inviting the Commission to:

a) Propose a Council regulation aiming to apply the Community limits to foodstuffs exported from the Community;
b) endeavour to bring about international agreement on the basis of the Community levels.

A proposal for a Council regulation (EEC) on the special conditions for exporting foodstuffs and feedingstuffs following a nuclear accident or any other case of radiological emergency has been submitted by the Commission to the Council in June 1988 (4). This proposal foresees that foodstuffs and feedingstuffs with a radioactive contamination greater than the levels enforced in application of regulation 3954/87 cannot be exported.

At the international level, the WHO/FAO Codex Alimentarius has put forward a proposal for radioactivity limits on food in international trade. In pursuit of the Council Resolution of 22 December 1987, the Commission is coordinating the Community position on this proposal and will participate in discussion in the Codex Alimentarius in 1989 with a view to getting suitable levels adopted by the Codex Commission, which are suitable and coherent with those of the Community.

Finally, the Commission decided that foodstuffs having a radioactive contamination greater than the maximum permissible levels laid down by Community regulations cannot be considered to be of sound, fair and merchantable quality. Therefore such products cannot be the subject of buying-in prices, of storage contract, of an export refund grant, of a Monetary Compensatory Amounts, or Accession Compensatory Amounts. With this goal in mind, the necessary modifications have been introduced into the agricultural regulations.(5)

1) COM (88) 293 final
2) COM (88) 709 final
3) OJ C 352 of 30.12.87
4) COM (88) 295 final
5) Commission Regulations N°s 88/3492 to 88/3502
OJ L306 of 11.11.88.

3. Rapid information system in the case of a radiological emergency: the 1986 IAEA Convention and the system

Another major development after the Chernobyl accident has been the setting up of rapid exchange information systems after a nuclear accident at world as well as at Community levels.

In the first days after the Chernobyl accident the Commission was hindered in its response by a lack of information on the general situation even within the Community. Member States were therefore requested to report the levels of environmental contamination, under the terms of Article 36 of the Euratom Treaty, as a matter of urgency and to update this information at least daily. However, the communications channels previously established for the purposes of this Article had not been intended for emergency situations and proved inadequate. The Commission, therefore, had recourse to another established emergency network designed to cater for food contamination events in general. While helpful, this did not prove ideal having been intended specifically for foodstuffs; moreover, the data received varied widely in content and format rendering collation and analysis extremely difficult. In consequence the Commission announced in a Communication to Council in August 1986 (1) a proposal to establish a system designed for radiological emergency purposes.

Meanwhile similar difficulties had been experienced beyond the Community and, following preparatory work in July and August in which the Commission was involved, the IAEA General Conference in September 1986, adopted a convention on early notification of a nuclear accident. This Community convention was immediately signed by all Member States and came into force in October of the same year. On a proposal of the Commission (2) the Council decided in December 1987 that the Community would accede to the convention. However, the decision cannot be immediately implemented because, under the terms of Article 102 of the Euratom Treaty, the convention can only be effective for the Community after all the Member States concerned have notified to the Commission that the convention is in conformity with the provisions of their national law. In practice, though, the Commission intends to note to the IAEA that it will act in conformity with the convention as soon as the procedure concerning the notification of a possible accident in an establishment of the Community Joint Research Center has been completed with the Member States concerned. This declaration is foreseen for the beginning of 1989. The Commission is currently considering, inter alia, provisions for connection to the World Meteorological Office's Global Telecommunications System as foreseen in the convention.

1) COM (86) 434 final
2) COM (86) 760 final

However, at the internal level the Commission considers that the IAEA convention does not fully cover the exchange of information needs within the Community. The Council, following a Commission proposal of April 1987 (1), decided to establish a specific Community system (2) which, in comparison to that of the IAEA, enlarges the scope of the emergencies to which the system applies, gives a more exact definition of the triggering mechanism, widens the range of information to be supplied and ensures diffusion of the information received to all Community Member States.

This decision is without prejudice to other bilateral or multilateral treaties or conventions agreed to by Member States. It has been in force since the beginning of April 1988 and the Commission has already circulated a list of the points of contact in Member States and in the Commission to be used in the event of any future radiological emergency. Initially the system is based on telex communications, with facsimile and telephone providing back-up, but it is anticipated that this will change to electronic mail facilities as these become available. Further work is in hand to agree the exact content and format of information to be communicated and to facilitate full implementation. It is the Commission's intention that this will be as compatible as possible with that being developed under the terms of the IAEA convention; close liaison between the Commission and IAEA is being ensured for this purpose.

4. Protection and assistance in the event of a nuclear accident or a radiological emergency.

In its framework communication (3) on the consequences of the Chernobyl nuclear accident, the Commission announced its intention to submit to the Council a proposal for the implementation of a Community system of mutual assistance in the event of an emergency.

As this is a complex field in which national competence largely takes precedence over that of the Community, the Commission planned to hold a number of consultations in advance.

The Chernobyl accident also showed that it would be useful to have a system of mutual assistance on as wide an international scale as possible and, at the special meeting of the IAEA General Assembly held from 24 to 26 September 1986 in Vienna, an international convention on mutual assistance in the case of a nuclear accident or radiological emergency was adopted. It has so far been signed by 11 Member States.

The Commission has favoured the accession of the Community to this international convention. A formal proposal was placed before the Council in January 1987.(4)

1) COM (87) 135 Final
2) Council Decision of 14.12.87, OJ L371 of 30.12.87
3) COM (86) 327 final
4) COM (86) 760 final

The reasons supporting the proposal for accession concern the JRC and can be summarized as follows:

- it would be useful for the JRC to be able to benefit from the assistance measures provided for under the convention;

- the JRC would be able to contribute, through its own resources, to the international assistance actions set up under the convention.

The proposal also reflects the view that international cooperation on as wide a scale as possible is required as regards mutual assistance in the nuclear field and shows the Commission's willingness to cooperate as closely as possible with the IAEA.

The proposal has been discussed within the Council but no decision has yet been taken.

The consultations with experts from the Member States announced by the Commission took place on 10/11 December 1986 and 23 February 1987. The establishment of the international convention on assistance was one of the main items considered.

The consultations have shown that there are a number of areas in which there could be useful cooperation at Community level such as:

a) Creation of a network of correspondents responsible for the exchange of information on preventive measures and measures to be taken in the event of an emergency.
b) Preparation of an inventory of special equipment and services available.
c) Definition of several research topics connected with mutual assistance.

In practical terms, the approach taken and the areas where cooperation was found to be necessary are similar to those used as a basis for conventional civil protection which were reflected in the Council resolutions adopted in June 1987 (1) and December 1988 (2).

The Commission will be reporting to the Council on this subject shortly.

1) OJ C 176 of 4.7.87 Resolution of the Council and the Representatives of the Governments of the Member States meeting within the Council.
2) ----------

5. The Directive on the provision of information to the general public.

Analysis of the Directive laying down the basic safety standards (1) has highlighted the general point that, although it ensures adequate protection of the general public and workers, it does not contain provisions for informing people living in the vicinity of nuclear installations. General provisions of this kind are contained in the Council Directive on the major-accident hazards of certain industrial activities, which is known as the Seveso Directive (2).

The Commission has taken the view that the Basic Standards should be supplemented to fill this gap and on 8 June 1988 it adopted a proposal for a Council Directive on informing the population about health protection measures to be applied and steps to be taken in the event of a radiological emergency (3).

The draft Directive, which takes account of the opinion expressed by the group of experts referred to in Article 31 of the Euratom Treaty, provides for two separate categories of information to be provided to the general public:

1) Information to make the public aware on a permanent basis of the measures taken for its protection and to describe the nature of the hazard in advance of any emergency situation; the public concerned are those groups which Member States consider to be at risk, i.e. the public for whose protection a Member State plans to take emergency measures in the event of a radiological emergency.

2) Information to be provided in a real emergency; the public concerned is not specifically defined in the Directive since its scope depends on the specific type of radiological emergency.

Furthermore, the draft specifies the particular nature of the information which should be provided:

- During the entire period of enforcement of regulations permitting the introduction and application of emergency measures, the public concerned must be supplied, in an appropriate manner, with general information on the radioactivity and the radiological emergencies envisaged and with more specific information on emergency health protection measures and evacuation plans.

1) Council directives 80/836 Euratom, OJ L 246 of 17.9.80
84/467 Euratom, OJ L 265 of 5.10.84
2) Council directives 82/510/CEE OJ L230 of 5.8.82
87/216/CEE OJ L85 of 28.3.87
88/610/CEE OJ L336 of 7.12.88
3) COM (88) 296 final

- In the actual event of a radiological emergency the public in question should receive appropriate information immediately, and repeatedly thereafter, on the radioactivity levels, the radiological emergency situation and its development, the public emergency measures adopted and the actions to be taken.

  The cross-border hazard has been taken into consideration both within the context of the information to be provided on a permanent basis with regard to the emergency measures planned to cope with accidents that might carry contamination from one Member State to another and within the context of the information to be provided in a cross-border emergency situation.

  On 17 June 1988 the Commission submitted the draft to the Economic and Social Committee to obtain its opinion, pursuant to Article 31 of the Euratom Treaty, before submitting the proposal to the Council. This opinion was given on 27 October 1988 (1) and the Commission has now sent to the Council a revised proposal (2).

6. ACTIVITIES CONNECTED WITH THE DIRECTIVES LAYING DOWN THE BASIC STANDARDS FOR THE HEALTH PROTECTION OF THE GENERAL PUBLIC AND WORKERS AGAINST THE DANGERS OF IONIZING RADIATION.

The specific activities decided after the Chernobyl accident should not obscure the permanent activities which form part of the implementation and regular updating by the Community of the Basic Safety Standards for health protection of the general public and workers against the dangers from ionizing radiation.

6.1. MONITORING OF BASIC SCIENTIFIC DATA AND RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION (ICRP) - LONG-TERM REVISION OF THE DIRECTIVE LAYING DOWN THE BASIC STANDARDS

The Commission, with the support of the group of experts provided for in Article 31 of the Euratom Treaty and the radiation protection research programme, is closely following scientific developments in this area and in particular the work of the ICRP and UNSCEAR. In particular, it is considering the need for possible adjustments as a result of the latest re-evaluations of the dosimetric data measurements for the Hiroshima and Nagasaki explosion survivors.

A working subgroup has been set up within the Group of Experts referred to in Article 31 of the Euratom Treaty to prepare a draft for a partial revision of the Directive while work progresses within the ICRP.

The Commission is cooperating in the work of other relevant international organisations to help maintain the international consensus in the field of radiation protection standards.

1) OJ C337 of 31.12.1988
2) COM (88) 809 final

In addition, in order to assess the scientific development and to check the progress made so far in the practical application of the Directive, the Commission held in Madrid in September 1988 its third seminar on the optimization of radiation protection - one of the key principles referred to in Article 6 of Directive 80/836/Euratom of 15 July 1980.

6.2. PROTECTION OF TEMPORARY WORKERS

The regulations on radiation protection adopted by the Member States pursuant to the Council Directive laying down the Basic Safety Standards for the health protection of the general public and workers against the dangers of ionizing radiation cover both regular workers of installations where there is a risk of exposure and workers from external subcontractors who are also exposed.The Directive makes no distinction between these two categories of workers as far as the fundamental principles governing operational protection and dose limits are concerned.

Nevertheless, the Commission is aware that in day-to-day work difficulties may arise for an appropriate protection of workers from external subcontractors and it is therefore currently preparing, following consultations with the group of experts referred to in Article 31 of the Euratom Treaty, a draft on specific practical arrangements for their protection.

The aim of the draft is to extend the primary employer's responsibility in respect of the radiation protection of its workers to the operator of the installation for any category A worker, as defined in the Basic Standards, who works in the installation but is not a member of its staff.

The draft also provides for the adoption of a radiation card for workers occasionally exposed to radiation in a controlled area to enable the operator to fulfil this obligation.

6.3. SHIPMENTS OF RADIOACTIVE WASTE

It is useful to remember that the Commission is preparing a proposal on the administrative control of shipments of radioactive waste following the conclusions drawn by the Parliament and the Commission from the Transnuklear-Mol affaire (1).

1) European Parliament Resolution of 6.7.88, OJ C 235 of 12.9.88

6.4. CONTROL OF THE IMPLEMENTATION OF DIRECTIVES LAYING DOWN THE BASIC STANDARDS

Member States have, in general, made efforts to implement the changes in the Basic Standards. These were first laid down by the Council in 1959 and have been revised and supplemented several times afterwards.

Nevertheless, the Commission had to intervene to expedite the full application of the most recent revisions and, to this end, initiated infringement proceedings against 10 Member States for failure to communicate their implementing legislation. Following these proceedings, a reasoned opinion was sent to one Member State.

Since the entry into force of the 1980 version of the Directive laying down the basic standards, the Commission has delivered 18 opinions under Article 33 of the Euratom Treaty on the provisions laid down by law, regulation or administrative action in the Member States to bring their legislation in line with the Directive.

Apart from natural radiation, most of the radiation which workers and the general public of the Community receive is generally the result of exposure in the course of medical examinations or treatment. The aim of Council Directive 84/466/Euratom of 3 September 1984 laying down measures for the radiation protection of persons undergoing medical (1) examination or treatment is to harmonize national practices as regards the training of medical and auxiliary staff and the monitoring of the safety of the technical equipment used.

The Commission has found that there have been delays in implementing the Directive in the Member States and has initiated infringement proceedings against 10 Member States for failure to communicate national implementing regulations.The Commission is also concerned to ensure that the Directive is uniformly applied throughout the Community. The optimization of image quality and patient exposure in diagnostic radiology requires technical development; the Commission organized a scientific seminar on this subject in September 1988.

7. COMMUNITY INSPECTIONS OF ENVIRONMENTAL RADIOACTIVITY LEVELS AND COMPLIANCE WITH THE BASIC STANDARDS.

In the 1960s the Commission exercised its right, under Article 35 of the Euratom Treaty, to inspect facilities for monitoring the level of radioactivty in the environment. On June 4, 1987 it wrote to the Member States to obtain the arrangements required to exercise this right once again.

1) OJ L 265 of 5.10.84

8.ENVIRONMENTAL IMPACT OF RADIOACTIVITY

The Commission has developed various activities related to the monitoring and evaluation of the impact of radioactivity on the environment.

8.1.PUBLICATION OF DATA SENT TO THE COMMISSION UNDER ARTICLE 36 OF THE EURATOM TREATY.

The Commission periodically publishes reports on the levels of radioactivity in the environment on the basis of data sent by the Member States. The report for 1984, 1985 and 1986 is currently being prepared and will be published in 1989.

After the Chernobyl accident the Commission decided to set up a computerized data bank, named REM (Radioactivity Environmental Monitoring) under the responsibility of the JRC Ispra for the collection of environmental radioactive contamination results in the Community.

The purpose of the REM data bank, which makes full use of the expertise available at Ispra on the design of scientific data banks, is to store in an orderly way the very large number of data generated by the Chernobyl accident for future use in, for example, the validation of environmental transfer models, dose estimation and radioactivity mapping. Thus the bank will provide data on radioactivity in air and precipitations after Chernobyl for an exercise on the validation of atmospheric dispersion models organized jointly by the Commission, the International Atomic Energy Agency and the World Meteorological Organization.

The bank was created with data voluntarily contributed by national laboratories. It has recently been enlarged to include selected data measured before the Chernobyl accident, and submitted to the Commision under the provisions of Art. 36 of the Euratom Treaty. In all about 300,000 data are presently included, covering concentrations of total beta and alpha activity and of selected radionuclides such as Iodine-131, Caesium-134, Caesium-137, Strontium-90, Cobalt-60, etc. in environmental samples, agricultural products and foodstuffs (air, rain, soil, grass, grain, milk, meat, etc.)

It is the Commission's intention to continue to develop the REM data bank and to add the data it will receive in future.

8.2. OPINION DELIVERED UNDER ARTICLE 37 AND REPORT TO THE EUROPEAN PARLIAMENT

Since the publication in February 1982 of the Commission recommendation regarding the application of Article 37 of the Euratom Treaty,(1) the Commission has delivered opinions on 30 plans for the discharge of radioactive effluents submitted under that Article.

In 1986 the Commission started to publish these opinions in the Official Journal.

On 15 March 1988 a report on the application of Article 37 during 1985 and 1986 was sent to the European Parliament.(2).

In its ruling of 22 September 1988 in the Case "Saarland et. al/Ministre de l'Industrie, des P. et T. et du Tourisme" (3) concerning the Cattenom nuclear power station, the Court of Justice gave an interpretation of Article 37 to the effect that general data relating to any plan to discharge radioactive effluents had to be sent to the Commission prior to the authorization of disposal by the competent authorities of the Member State concerned.

The Commission plans to publish in 1989 a report on the actual radioactive discharges from nuclear power stations and reprocessing plants for the period 1977 to 1986. Similar reports, covering the years from 1969 to 1976 have been published in the past.

8.3. EMISSION STANDARDS

The Commission organised on 10-11 February 1987 a meeting with the participation of the delegates from Member States on the Methods used for fixing discharge limits of radioactive effluents from nuclear installations in the Member States. At this meeting the national practices were presented and it appeared that the fundamental principles of justification, optimization of protection (ALARA principle) and of individual dose limitation established by the basic safety standards are applied. However, there are some differences in the way the ALARA principle is applied in different Member States to define the discharge limits for the individual nuclear facilities.

1) OJ L 83 of 29.3.1982
2) COM (88) 109 final
3) Case 187/87

Several experts were in favour of continuing these activities in a Community framework, with a view to harmonize the dose levels to be considered as well as the methodologies for deriving discharge limits. All the experts but one were opposed to the adoption of Community emission standards for nuclear facilities mainly on the ground that they would not allow to take into account the environmental site characteristics and would be in conflict with the ALARA principle laid down in the Basic Standards. A full report of the meeting has been published. (1).

The complex issue of discharge limits will also be studied in the frame of the revision of the directives on the Basic Standards.

8.4. NEGOTIATING BRIEF ON ACCESSION TO THE LONDON DUMPING CONVENTION

On 20 October 1986 the Commission submitted to the Council a recommendation for a Council decision (2) authorizing the Commission to negotiate the accession of the European Community to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter. The recommendation is being considered by the Council.

8.5. IMPLEMENTATION OF THE DIRECTIVE ON THE ASSESSMENT OF THE EFFECTS OF CERTAIN PUBLIC AND PRIVATE PROJECTS ON THE ENVIRONMENT.

This directive adopted by the Council in 1985 (3) became operational in July 1988. Its scope of application includes in particular the nuclear facilities.

The directive deals in particular with the transfrontier issue. Article 7 foresees that where a Member State is aware that a project is likely to have significant effects on the environment in another Member State or where a Member State likely to be significantly affected so requests, the Member State in whose territory the project is intended to be carried out shall forward the information gathered to the other Member State at the same time as it makes it available to its own nationals. Such information shall serve as a basis for any consultations necessary in the framework of the bilateral relations between two Member States on a reciprocal and equivalent basis.

The quasi-totality of the Member States communicated to the Commission the national measures adopted to transpose the directive into national legislation. The Commission is presently evaluating the individual national provisions to verify their compliance with the requirements of the directive.

1) Radioprotection N° 42 (XI-3133-88)
2) SEC (86) 1635 final
3) Directive 85/337/CEE, OJ L 175 of 5.7.85

9. PROVISION OF INFORMATION

The Commission's activities with regard to the provision of information are taking place at several different levels. At the regulatory level, the Commission has prepared the draft Directive referred to in paragraph 5 above.

There are a number of activities to support those of the national authorities:

- On 5, 6 and 7 October 1987, the Commission held the first meeting of the Standing Conference on Health and Safety in the Nuclear Age, the aim being to provide the public, via the media, with as much objective information as possible about the potential hazards of ionizing radiation from all sources.

  About 120 representatives of scientific groups, the media, consumer and environmental protection organisations, the two sides of industry and the national authorities attended the conference. This was the first Community-level meeting at which all groups concerned were able to exchange views on the health problems associated with ionizing radiation.

  The proceedings from the meeting have been published and a second meeting is planned for 1989.

- An international seminar on the provision of information to and training of radiation protection workers was held in Luxembourg from 28 to 30 November 1988.

- Two information seminars on radiation protection for trade union representatives were held in Luxembourg on 8 and 9 July 1987 and on 12 and 13 December 1988.

- The third scientific seminar on the optimization of radiation protection was held from 12 to 14 September 1988 in Madrid (see point 6.1 above).

- A scientific seminar on the transfer of radionuclides to cattle was held from 5 to 8 September 1988 in Oxford (see point 2 above)

- A scientific seminar on the real-time evaluation of the radiological consequences of accidental releases of radioactivity will be held in Luxembourg on 16-19 May 1989

1) EUR 11608

- An audiovisual production prepared to make workers aware of the problems of radiation protection will be suplemented by modules on health protection of the public and environmental aspects.

- Information brochures for the public are also being prepared.

To promote the participation of the social partners in the actions and decisions in the area of radiation protection, the Commission submitted to the Council on 7 April 1987 a proposal for a Council Decision to extend the responsibilities of the Advisory Committee on Safety, Hygiene and Health Protection at Work to include health protection against the dangers arising from ionizing radiations (1).

The Economic and Social Committee and the European Parliament delivered their opinions on 24 September 1987 (2) and 15 April 1988 (3) respectively.

The proposal is being considered by the Council.

10. TECHNOLOGICAL SAFETY - IMPLEMENTATION OF THE COUNCIL RESOLUTION OF 22 JULY 1975.

The Commission has sent to the Council and Parliament a report on the implementation of the Council Resolution of 22 July 1975 concerning the technological problems of nuclear safety (4).

It contains recommendations for an overall approach better suited to the situation that has arisen following Chernobyl.

The strategy advocated by the Commission does not require the introduction of new legal instruments and can be implemented using existing collaboration structures and mechanisms so as to obtain concrete, satisfactory results within reasonable time limits.

1) OJ C111 of 25.4.87
2) OJ C319 of 30.11.87
3) OJ C122 of 9.5.88
4) COM (87) 96 final

The strategy is four-fold:

- to continue and draw provisional conclusions from the harmonization process undertaken following the Council Resolution of 22 July 1975 by publishing the main criteria and guidelines for the safety of light-water and fast breeder reactors;
- to promote cooperation in the field of the systematic analysis of reactor safety at Community level so as to guarantee the mutual transparency of the methodologies and plans used in such analysis, its scope, and the input data and results;
- to examine the situation with regard to human resources and the main installation devoted to research and development in the field of the safety of nuclear installations to ensure that a certain slowing down in the pace of development of nuclear energy does not weaken the basis of the Community's considerable achievements with regard to nuclear safety;
- to strengthen the co-operation on nuclear safety between on the one hand the Member States together with the Community and on the other the IAEA along with other relevant international organizations involving non-member States where there are major nuclear activities whose safety was very important to the people of the Community.

The Council in its conclusions of 26 September 1988 has endorsed this strategy and asked the Commission to extend it to all types of reactors.

The Commission will submit an annual report to the Council on the activities undertaken and the progress made.

The Commission will shortly be publishing a report setting out the consensus of the safety authorities, manufacturers and electricity producers in the Member States with regard to the methods and objectives which form a basis for guaranteeing the safety of nuclear power stations, both in terms of design and operation. This report has been discussed by the Euratom Scientific and Technical Committee and has been favorably evaluated.

11. EXCHANGE OF INFORMATION WITH REGARD TO INCIDENTS.

In its communication COM (86)327, the Commission considered that a compulsory Community system for the reporting of nuclear incidents should be adopted, the aim being to make the international exchange and the joint analysis of information on incidents more effective.

The original context in which this proposal was made has gradually changed.

In addition to the system AORS (Abnormal Occurence Reporting System) existing at Community level, provision for the exchange of information about incidents is being made within various international frameworks:

- The Incident Reporting System (IRS) of the Nuclear Engergy Agency (NEA) has been expanded by improving the presentation of reports and the classification methods and reducing delays. The meetings held to examine the lessons to be drawn from particularly interesting incidents are attracting a growing number of OECD countries.
- The IRS system of the IAEA has been further developed and its links with the NEA's IRS have been strengthened. The IAEA and the NEA exchange all their reports on a mutual basis. Joint meetings are also held.
- The electricity companies have also mustered their forces. In October 1987, representatives of 130 electricity companies producing nuclear power in 26 countries set up a new system for the exchange of information on incidents related to safety, maintenance and cost-reduction that occur during the operation of nuclear power stations.

These developments offer new opportunities for improving safety on the basis of exchange of information about incidents.

As a result of all the work undertaken following Chernobyl it is now possible to determine the approach to be adopted with regard to nuclear safety and to focus on the relationship between health protection, where the Euratom Treaty provides for binding legal instruments, and technological safety, which is governed by cooperation mechanisms.

Thus, in the present circumstances, the initial proposal for a compulsory system of reporting has not been pursued.

The special characteristics and scope of the Abnormal Occurences Reporting System (AORS) developed by the JRC cannot be found in other existing systems. The JRC should therefore promote the use of the AORC in cooperation with potential users on the widest possible scale. Contacts with potential users have been pursued following the appeal for cooperation made at the meeting of electricity producers in October 1987 The Euratom Scientific and Technical Committee has underlined the importance of reaching an agreement with the utilities, at least in the European zone, to assure that the JRC will have access to the informations collected by them and it will be able to contribute to the developments in progress at international level, in particular on the basis of its expertise in the field of methods of analysis.

12. REPORT AND STUDIES ON THE CHERNOBYL ACCIDENT

The Commission sent a report (1) to the Council and the European Parliament on the Chernobyl accident which includes a technical description of the accident as well as of its impact on the Community. The Commission has also distributed the results from a study requested to the National Radiological Protection Board (United Kingdom) on the radiological impact on the population.(2)

13. TRANSPORT OF RADIOACTIVE MATERIAL

In a communication on the transport of dangerous goods and wastes (3) the Commission announced a number of measures to implement a better harmonization and to assure the effective application of the regulations governing the transport of dangerous goods of which radioactive materials are a special category in the internationally recognized classifications.

In accordance with this work programme, the Commission sent to the Council two proposals, one affecting the professional training of transport drivers of road vehicles (4), and the other for the operators undertaking transport operations of dangerous goods (5). Both are currently under Council consideration. Afterwards the Commission will be requested to take a stand on two other proposals, one intended to urge the Member States which have not yet done so, to ratify the European Agreement concerning the International carriage of Dangerous Goods by Road (ADR) the second one concerning the laying down of minimum standards for ships arriving or leaving Community harbours and carrying dangerous goods. A proposal on improved controls of road vehicles carrying dangerous goods is also under study.

In addition to the regulatory activities, the Commission services chair and provide the Secretariat of a special working party on the transport of radioactive materials composed of representatives from national authorities, whose activities are concerned with the technological safety of transport operations. A communication on the activities of the special working party will be submitted to the Council and to the Parliament at the beginning of 1989.

All these measures go beyond their immediate impact on the safety of transport, aiming also at the implementation of the internal market in the transport sector.

1. COM (86) 607 final
2. EUR 11523
3. COM (87) 182 final
4. COM (88) 339 final
5. COM (88) 95 final

14. RADIATION PROTECTION RESEARCH PROGRAMME

14.1 Revision of the radiation protection research programme 1985-1989

Following the Chernobyl accident, a revision of the research programme on radiation protection 1985-1989 has been proposed by the Commission and adopted by the Council on 21 December 1987 (1); this revision takes account of the opinion of the Committee of High Level Independent Scientists. (EUR 11449) mentioned in paragraph 2 and of the advice of the Euratom Scientific and Technical Committee. A total of 10 collaborative research projects were defined, with a total budget of 10 mio ECU. Meanwhile, over 50 contracts were concluded and final reports are expected by the end of 1989 - beginning 1990.

The Collaborative research projects deal with:

- Evaluation of the reliability and meaningfulness of long distance atmospheric transfer models;
- Evaluation of data on the transfer of radionuclides in the foodchain;
- Feasibility of epidemiological studies on health effects in the population;
- Radiological aspets of nuclear accident scenarios;
- Underlying data for derived emergency reference levels;
- Improvement of practical countermeasures with respect to the agricultural and aquatic environment;
- Improvement of practical countermeasures with respect to the urban environment;
- Improvement of practical countermeasures with respect to preventive medication;
- Monitoring and surveillance in accidental situations;
- Research in the field of treatment methodologies of exposed persons.

These projects aim at improving the evaluation of the radiological consequences of nuclear accidents and at upgrading the overall preparedness for hypothetical future accidents. The most important aspects are:

1) OJ L16 of 21.1.1988

a) Research needs with respect to the radiological consequences of the Chernobyl accident.

The Chernobyl accident dispersed radioactive material all over Europe. The radiological consequences of this accident are evaluated. Available environmental models for atmospheric, aquatic and terrestrial dispersion and for transfer through the food chain are validated and their degree of uncertainty assessed.

The specific physico-chemical characteristion of the radionuclides involved as well as the influnce of climate, soil and agricultural practices on critical pathways of radionuclide transfer and uptake are taken into account. The studies on environmental pathways are supplemented, where possible, by investigations of metabolic parameters governing radionuclide behaviour in man at different ages.

The accident has not caused immediate health consequences to the population in the Community, however some long-term effects might occur although their number will probably be so small so as not to be detectable in a statistically significant way. However, the available data are evaluated and, when necessary a detailed follow-up will be proposed.

The accident has shed some new light on immediate health consequences and on the treatment requirements of victims from nuclear accident. Problems which now need to be reviewed and evaluated in more detail are: the existing accident dosimetry, the effects of dose and dose distribution, the radionuclide contamination, the use of radioprotectors, and the effect of associated trauma.

b) Research needs with respect to preparedness for hypothetical future accidents.

Early and late radiological consequences of hypothetical accident scenarios are studied by probabilistic risk assessments. Further development must be stimulated by designing more reliable methodologies. The ongoing efforts are extended to studies on the testing of emergency management scenarios. It is necessary to reconsider the development of countermeasures to prevent and reduce accident consequences to the rural and urban environment as well as to the population.

The Chernobyl accident highlights the need for a reliable scientific basis for setting maximum permitted radioactivity levels in foodstuffs, feedingstuffs and drinking water. As these levels are important for future decision-making they must be obtained by a careful assessment of all steps linking them to potential health effects, and this will require selected experimental studies.

A wide range of exposure conditions may have to be dealt with in the case of a nuclear accident, and prompt action may be required under less than optimal conditions. Thus, better and more rapid accident dosimetry must be developed. In extreme cases, when exposure reaches life-threatening levels, bone marrow transplantation, an established technique developed in previous years with the support of the Radiation Protection programme, might be an ultimate life-saving resort under well-defined clinical conditions. Other treatment schedules must also be improved, in particular for situations where many persons are exposed to doses which can cause radiation syndromes and for which bone marrow transplantations is not useful or feasible. Such schedules involve aseptic management, treatments to accelerate recovery of the bone marrow and supportive treatments. Conditions where other injury is present need also to be considered. Suitable criteria and rapid tests must be developed to facilitate the decision for an optimal treatment.

14.2 Radiological protection research programme for 1990-1994.

The Community research needs in radiological protection continue for the period 1990-1994. They originate mainly from the importance of assuring an adequate protection of workers and the public against ionizing radiation, from the Commission's regulatory duties, and from the need to develop techniques and criteria for countermeasures to prevent or limit exposure under normal or accident conditions. Many research needs have been redefined taking into account progress in radiation protection philosophy and practice as well as the increased concern of the public for reducing risks from radiation exposure.

The following subject areas are given priority:

A) Human Exposure to Radiation and Radioactivity.
   A.1. Measurement of Radiation Dose and its Interpretation
   A.2. Transfer and Behaviour of Radionuclides in the Environment.

B) Consequences of Radiation Exposure to Man; their Assessment, Prevention and Treatment.
   B.1. Stochastic Effects of Radiation.
   B.2. Non-stochastic Effects of Radiation.
   B.3. Radiation effects on the developing organism.

C) Risk and Management of Radiation Exposure.
   C.1. Assessment of human exposure and risks.
   C.2. Optimization and Management of Radiation Protection.

15. JRC RESEARCH PROGRAMME

The research programme of the JRC covering the years 1987-1991, approved by the Council on 14 October 1988 (1) prolongs the on-going activities concerning reactor safety, radioactive waste and control of fissile materials.

Among the activities more closely related to the Chernobyl accident, it is worth mentioning the actions REM and AORS already mentioned and a project named TERME SOURCE aiming at achieving a consensus among the European scientists on the set of parameters characterizing in terms of quantity, composition and time the release beyond a barrier of radioactive materials following a nuclear reactor accident (this set of parameters is designated as Terme Source). The Chernobyl Accident underlined the importance of the evaluation of the radioactive releases from a nuclear power station after a severe accident and the need to reduce uncertainties in its evaluation.

The JRC activities are focused on:

- The development, with the Member States, of source term analytical models covering a wide range of accidental situations;

- the continuation of the participation in selected experimental programmes in progress in the Member States by means both of shared cost actions (for instance participation in the programme PHEBUS PF performed by the French Commissariat á l'Energie Atomique) and of direct performance of specific supporting experiments, in the JRC establishments of Ispra and Karlsruhe.

1) OJ L286 of 20.10.1988

16 Proposal for the TELEMAN Programme.

A proposal for a shared cost research programme in the field of remote handling in nuclear hazardous and disordered environments (TELEMAN) has been submitted by the Council. Certain aspects of this programme concern the management of nuclear accident.