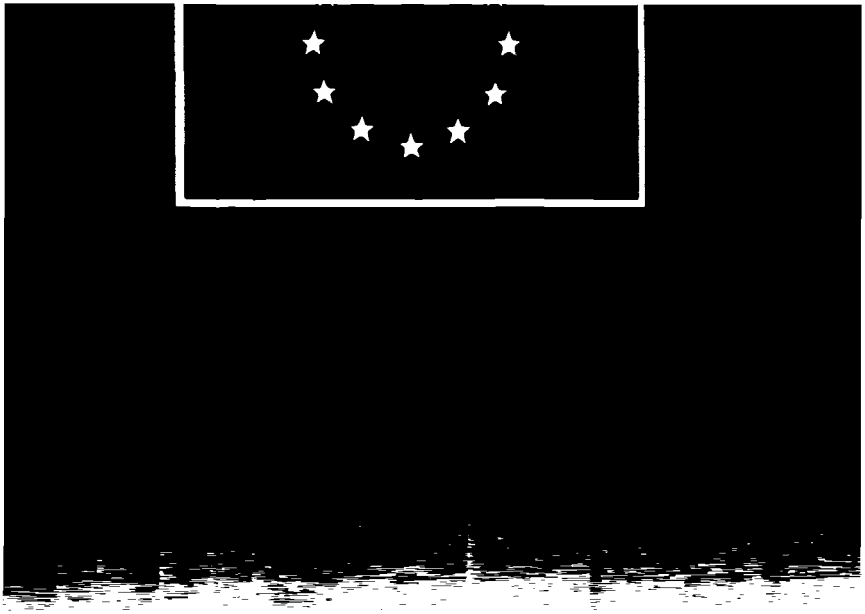

Nuclear safety: The European Community following the Chernobyl accident

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12/89

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On 26 April 1986, a serious accident occurred in reactor No 4 at the Chernobyl nuclear site in the Ukraine (USSR). As a result of a series of manoeuvres carried out contrary to safety regulations, sudden and uncontrollable increases in power caused the destruction of the reactor and of the building in which it was housed, as well as a fire which could be brought under control only after several days. This fire was the principal reason for the dispersal of radioactive material into the atmosphere.

Thirty-one members of the plant staff and emergency relief crews gave their lives to stop the discharges into the atmosphere and lessen the consequences of the accident, while 135 000 people living within a radius of 30 kilometres from the plant had to be evacuated.

In western Europe, an increase in radioactivity levels was rapidly detected, first in Sweden and then in the European Community. Heavy rainfall during the passage of the radioactive cloud, in the period between 27 April and 12 May, resulted in significant deposits, unevenly distributed, of radioactive nuclides – particularly iodine and caesium. It quickly became clear that, in the Community, contaminated agricultural produce for human consumption was the vehicle for exposure of man to radioactivity – with possibly serious radiological consequences.

When the Chernobyl accident was made known, the European Commission set in motion all available systems for information exchange. It also submitted a report to the European Parliament and the Council of Ministers describing the accident and its consequences in the Community; in June 1986 the Commission adopted a work programme to make use of the lessons to be drawn from the accident in the areas of health, safety of installations and nuclear research.

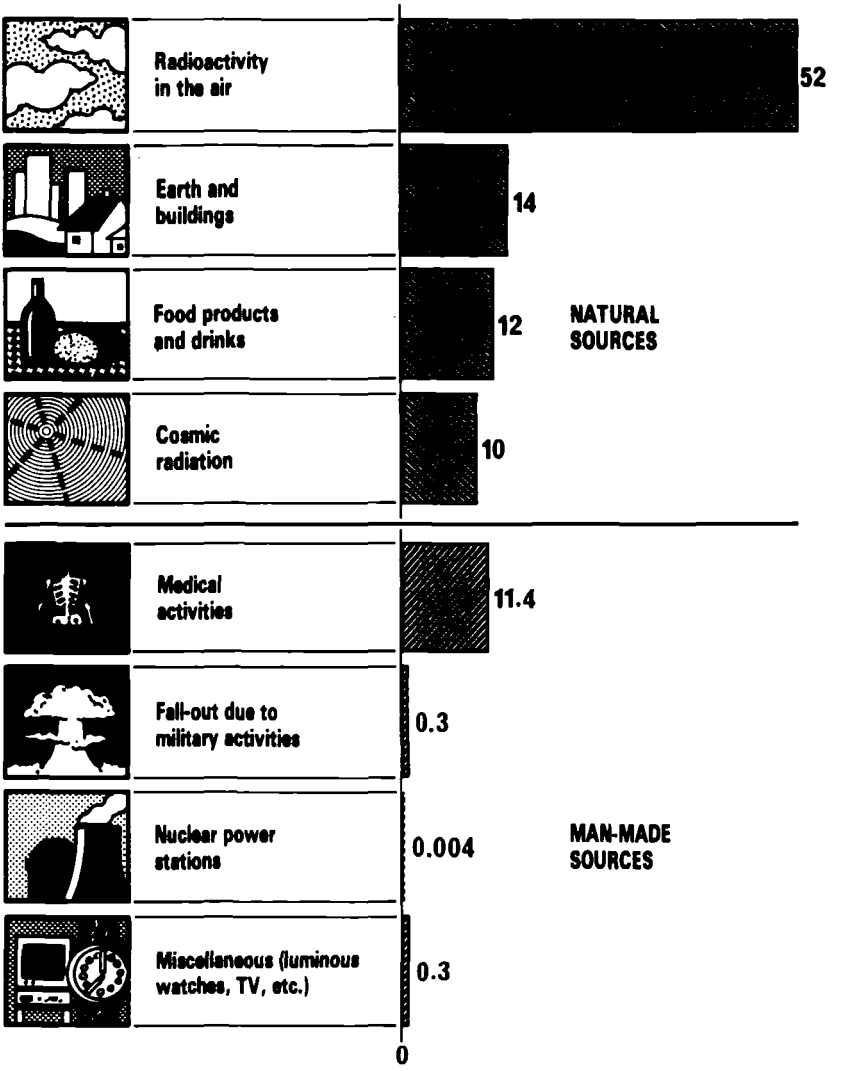
This file provides a summary of the activities initiated. Their principal areas of application are:

- ☐ Health protection against contaminated food.
- ☐ Improving information systems for emergencies.
- ☐ Setting up networks for protection and mutual assistance in the event of a nuclear accident or radiation emergency.
- ☐ Informing the people about nuclear dangers and protection from them.

Chernobyl also brought about the reorientation or strengthening of a range of activities launched well beforehand in the field of nuclear safety, in accordance with the provisions of the 1957 Euratom Treaty establishing the European Atomic Energy Community.[1] These activities are permanent, as opposed to the special measures taken in 1986. They particularly involve:

[1] See also *European File* No 18/87: 'Nuclear energy in the European Community'.

Sources of exposure to radiation (typical Community breakdown, as % of the average annual dose)



Total annual dose, on average: 2.5 units. In 1986, the Chernobyl accident added between 0 and 0.5 units, depending on the Community region concerned.

Source: Peter Saunders, *Radiation and you*, published by the Commission of the European Communities, 1989.

- ☐ The protection of health against ionizing radiation.
- ☐ The study of the impact of radioactivity on the environment.
- ☐ The technological safety of nuclear installations.
- ☐ Scientific research.

Chapter III of the Euratom Treaty is entirely given over to the protection of health against radiation, whatever its origin (see table). The Treaty provides for:

- ☐ The establishment of basic Community standards to protect the health of the general public and workers.
- ☐ The creation of a group of scientific experts, drawn from outside the European Commission, whose task is to assist the Commission in the drawing up and revision of these basic standards.
- ☐ The institution by the Member States of appropriate legal provisions to ensure that the standards are respected.
- ☐ The installation by each Member State of the means for permanent monitoring of radioactivity levels (in the atmosphere, water and earth) and of compliance with basic standards, as well as the regular communication to the Commission of the results of this monitoring.
- ☐ The communication to the European Commission by each Member State of general data on any plan for disposing of radioactive waste.
- ☐ The Community's right to issue recommendations to the Member States on radioactivity levels in the atmosphere, water and earth. In the event of an emergency, the Commission can issue a directive requiring the Member State in question to take all the measures that are necessary to avoid breaching basic standards.

Protection against radioactive contamination of food

The radioactive cloud from the Chernobyl accident contaminated a range of agricultural products destined for human consumption. In addition, radioactivity in grassland and foodstuffs for cattle was passed on into milk and meat. In the weeks after the accident, the Community took the following emergency measures:

- ☐ On 2 May 1986, the Community system for rapid alert in cases of food contamination was put into effect.
- ☐ On 6 May 1986, having regard to the immediate danger from iodine 131, the Commission adopted a recommendation calling on Member States to set certain maximum-acceptable radioactivity levels for consumers, in regard to milk, milk products and fruit and vegetables.

- On 12 May 1986, the Community temporarily suspended the import of some agricultural products from the Soviet Union and other Eastern European countries. These measures remained in force until the end of May 1986.

- On 30 May 1986, the Council adopted a new regulation fixing the maximum levels for contamination of foodstuffs, in particular by caesium 134 and 137. This regulation, which replaced the total ban on imports previously in force, was extended and remains valid until the end of 1989. The limits fixed are for a level of 370 becquerels/kg for milk products and infant foodstuffs and a level of 600 Bq/kg for all other foodstuffs. Member States have undertaken not to apply stricter standards to intra-Community imports. These standards were also adopted by 15 of the Community's main agricultural trading partners, including the USSR.

- On 22 December 1987, the Council established the principal elements for permanent legislation, by setting maximum permitted levels for the radioactive contamination of foodstuffs and feedingstuffs in the event of a nuclear accident or any other radiological emergency. In preparing this regulation, the Commission had consulted groups of experts and organized an international scientific seminar with the participation of some 100 specialists from 27 countries and of five international organizations.

- As the December 1987 regulation has to be completed to cover baby foods, liquid foodstuffs, minor foodstuffs and feedingstuffs, the Commission has submitted proposals to that end.

- In June 1988, the Commission proposed a regulation prohibiting the export of foodstuffs and feedingstuffs with a radioactive contamination level in excess of the new standards adopted. Such products can no longer be considered to be of 'sound, fair and merchantable quality', and cannot therefore benefit from Community agricultural aid.

These Commission initiatives have enabled the Community to be a driving force in the world for the establishment of radioactive contamination limits for food. The Commission participates in discussions within different international organizations with the aim of fixing world radioactivity limits.

Emergency information system

A further major development after the Chernobyl accident was the setting up of rapid exchange information systems for radiological emergencies, at world as well as at Community levels.

- In the days following the accident, the European Commission asked the Member States, under the terms of the Euratom Treaty, to report the levels of environmental contamination on their own territory. Because the existing communication channels were not suitable for emergency situations, the

Commission had recourse to the emergency network system for food contamination in general. This network, although very useful, was not well suited to the type of information to be communicated. The Community therefore decided, in December 1987, to equip itself with a new system of rapid information exchange, specially designed for radiological emergency purposes.

☐ As similar difficulties had been experienced outside the Community, an international convention on the early notification of a nuclear accident was adopted in September 1986, in Vienna, under the auspices of the IAEA (the International Atomic Energy Agency). All the Community Member States signed this convention and, in December 1987, the Council of Ministers decided on the accession of the Community itself. The European Community system, however, is wider in scope and more suited to Community needs than the IAEA system with which there is close liaison.

Mutual protection and assistance in the event of an accident or emergency

The Chernobyl accident made it possible to identify the improvements which could be made in systems of alert and health protection for areas around the sites of nuclear installations. It also demonstrated the usefulness of an international system of mutual assistance.

☐ In September 1986, an international convention on mutual assistance in the event of a nuclear accident or radiological emergency was adopted in Vienna under the auspices of the IAEA. The European Commission proposed to the Council of Ministers that the Community should sign it along with the Member States. The Community's Joint Research Centre could thereby contribute to international assistance activities and, should the need arise, benefit from them.

☐ In addition, various consultations with experts, organized by the Commission in December 1986 and February 1987, identified areas open to closer Community cooperation: a network of correspondents; an inventory of special equipment and services; the definition of research topics on mutual assistance, etc.

Informing the general public

In the months after the Chernobyl accident, the measures taken by the European Community paid particular attention to health protection for the general public and workers against ionizing radiation. They left to one side the problem of informing the public, even though other Community measures require that information be provided to those living in the vicinity of certain industrial activities which pose major accident hazards.

☐ In order to fill this gap, the European Commission submitted in 1988 a proposal for a directive on informing the population about health protection measures to

be applied and steps to be taken in the event of a radiological emergency. This text concerns the permanent provision of information to the general public as well as the information to be given in an emergency. Preventive information of a permanent nature should cover radioactivity in general, possible radiological emergency situations, emergency measures for health protection and evacuation plans. In the event of an accident, the people affected should receive, as soon as possible and repeatedly, information on ambient radioactivity, on the nature of the emergency situation and how it is developing, on protection measures already undertaken and on appropriate steps to be taken. The possibility of an accident occurring on a nuclear site close to a border has been considered and special information measures are provided for this purpose.

- In addition, the European Commission took several initiatives to inform the public in general. In particular, it organized in October 1987 the first meeting of the Standing Conference on Health and Safety in the Nuclear Age, with the aim of providing the public, through the media, with as much objective information as possible about the potential hazards of ionizing radiation from all sources. The 120 conference participants represented scientific circles, the media, consumer and environmental protection organizations, both sides of industry and national authorities. The session proceedings were published and a second meeting is envisaged for this year.

Permanent activities for health protection

While taking particular measures as a result of the Chernobyl accident, the Commission has also continued with activities in which it has been engaged for a long time, concerning basic standards for the protection of public health and workers' health against risks from ionizing radiation in general. In this context, the Commission:

- Monitors implementation of the directives which set out basic standards. First established in 1959, these standards have been revised and supplemented on several occasions. The most recent adjustments date from 1980 and 1984. The Commission had to intervene to expedite the full application of the last revisions.

- Follows developments in scientific knowledge, in close cooperation with specialized international bodies, so as to assess any possible need to adjust basic standards.

- Has recently drawn up a proposal for a directive providing greater protection of workers temporarily employed in nuclear installations. The aim of the draft is to extend the primary employer's responsibility to the operator of the installation which is temporarily engaging external workers. A certificate for workers occasionally exposed to radiation would enable the primary employer and the operator to fulfil their obligations.

- Has also recently drawn up a proposal on the administrative control of transfrontier shipments of radioactive waste, similar to the control already

provided for under Community legislation for other dangerous waste. The Commission, which conducts a special working group on the transport of radioactive material, has taken other initiatives concerning dangerous products, including nuclear products, as part of its transport policy. For example, it has prepared or is preparing proposals on the professional training of transport operators and drivers of road transport vehicles; on the control of vehicles transporting dangerous material; on ratification of the European agreement concerning the international carriage of dangerous goods by road; and on the laying down of minimum standards for ships frequenting Community harbours and carrying dangerous goods.

Studying the impact of radioactivity on the environment

The European Community assesses and controls the environmental effects of radioactivity. In this context, the Commission:

- ☐ Publishes regular reports on the levels of radioactivity in the environment.
- ☐ Established the REM (Radioactivity environmental monitoring) computerized databank, under the responsibility of the Joint Research Centre (JRC) at Ispra, for the collection of environmental radioactive contamination data in the Community. This databank has been supplied with some 300 000 items of information collected by national laboratories before and during the Chernobyl alert. One use for it will be in the designing of an exercise on the validation of atmospheric dispersion models, jointly organized by the Commission, the IAEA and the World Meteorological Organization.
- ☐ Delivers opinions on plans for the discharge of radioactive effluents. Under the terms of Article 37 of the Euratom Treaty, each Member State is required to provide the Commission with 'general data' on any such plan, whatever form it may take, which is liable to contaminate the water, earth or atmosphere of another Member State. The Commission must then issue an opinion on the plan, having first consulted a group of experts.

  A Commission recommendation details the operational procedures covered, defines more precisely the meaning of 'general data' and specifies the period within which this data must be communicated. The text also specifies the frequency with which data is to be supplied on radioactive effluent from different types of operation, including the dumping of radioactive waste at sea. The Commission regularly publishes a report of these data.

  The opinions delivered by the Commission under Article 37 concern the radiological consequences of normal and accidental discharges of radioactive material. They can recommend lower discharge limits, special environmental monitoring, specific rules applicable to contaminated foodstuffs, and provisions for the rapid exchange of information and mutual assistance in the event of an accident. These opinions are published regularly in the *Official Journal of the European Communities.*

- Pursues consultations with experts aimed at harmonizing the methods for determining limits on the discharge of radioactive effluents into the environment.

- Controls the implementation of the European Community directive on the assessment of the effects of certain major public and private projects on the environment. Operational from July 1988, this directive, which particularly includes nuclear facilities in its field of application, takes special account of the transfrontier dimension: the Member State, in which a project is to be carried out which is likely to have significant effects on the environment of a neighbouring country, is required to communicate to its neighbour any information which it has gathered, at the same time as it makes this information available to its own nationals.

Technological aspects of nuclear safety

Even though the Chernobyl reactors were of a different type to European Community reactors, new initiatives on technological safety were taken by the Community after the accident.

In 1987, the European Commission sent the Council of Ministers and the European Parliament a report on the technological problems of nuclear safety. The report contains recommendations for an overall approach better suited to the situation that has developed following Chernobyl. This approach does not imply the introduction of supplementary legal instruments, rather it relies on existing structures and procedures for collaboration with safety authorities, operators and nuclear plant manufacturers. In September 1988, the Council endorsed the proposed strategy. The report has just been followed by a further document which sets out the consensus of public authorities, plant manufacturers and electricity producers on the methods and objectives needed to ensure the safety of nuclear power stations.

Research programmes

- The Euratom Treaty made the Community responsible for scientific research on radiation protection. After the Chernobyl accident, the 1985-89 research programme was reoriented so as to improve evaluation of the radiological consequences of possible nuclear accidents and secure greater preparedness for coping with such accidents.

  For the 1990-94 period, Community research is to be devoted to improving protection for workers and the public against ionizing radiation, on the basis of three priority concerns: exposure of people to radiation and radioactivity, the human consequences of such exposure, the risks and management of radiation exposure.

- Problems posed by reactor safety and radioactive waste figure prominently in the 1987-91 programme of the Joint Research Centre. Activities closely related to

the effects of the Chernobyl accident include the management of the REM databank, mentioned earlier, and of the AORS (Abnormal occurrence reporting system) which involves the exchange of information on operational incidents at nuclear power plants with a view to analysing cause and effect. There is also the Terme source project, which aims to achieve a consensus among European scientists on the parameters for evaluating the quantity of radioactive material released after a nuclear accident ■

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