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Report

drawn up on behalf of the Committee on Energy, Research and Technology

on the conditions for a Community policy on the siting of nuclear power stations
taking account of their acceptability for the population

Rapporteur: Mrs H. WALZ

PE 40.985/fin.

By letter of 16 July 1974, the Committee on Energy, Research and Technology requested authorization to draw up a report on the conditions for a Community policy on the siting of nuclear power stations taking account of their acceptability for the population.

Authorization was given by the President of the European Parliament in his letter of 19 July 1974. On 6 September 1974, the Committee on Public Health and the Environment was asked for its opinion.

On 30 September 1974, the Committee on Energy, Research and Technology appointed Mrs Walz rapporteur.

It considered the draft report at its meetings of 30 September 1974, 25 June 1975, 29 September 1975, 22 October 1975 and 3 November 1975, and adopted the motion for a resolution and explanatory statement unanimously with one abstention on 3 November 1975.

Present: Mr Springorum, chairman; Mr Flämig, vice-chairman; Mrs Walz, rapporteur; Lord Bessborough, Mr Bersani (deputizing for Mr Andreotti), Mr Burgbacher, Mr Ellis, Mr Giraud, Mr Vander Gun, Mr Hamilton, Mr Hougardy, Mrs Kruchow, Mr Lautenschlager, Mr W. Müller, Mr Noè, Mr Normanton, Mr Osborn and Mr Vandewiele.

The opinion of the Committee on Public Health and the Environment is attached.

C o n t e n t s

	<u>Page</u>
A. Motion for a resolution	5
B. Explanatory statement	8
Introduction	8
I. The nuclear programmes of the Member States	9
(a) Nuclear power stations at present in service in the Community and short-term programmes of the Member States	9
(b) The long-term nuclear programmes	10
II. Planning permission procedures	11
(a) Community definition of installations covered by the regulations	11
(b) Informing public opinion	11
(c) Role of the local and regional authorities in planning permission	12
(d) Level of the final decision	12
III. The choice of sites	14
(a) Criteria considered	14
(b) Safety problems directly connected with the choice of site	15
(c) The role of the Community	15
IV. Conclusions	16
Opinion of the Committee on Public Health and the Environment	19

The Committee on Energy, Research and Technology hereby submits to the European Parliament the following motion for a resolution, together with explanatory statement:

MOTION FOR A RESOLUTION

on the conditions for a Community policy on the siting of nuclear power stations taking account of their acceptability for the population

The European Parliament,

- having regard to the report of the Committee on Energy, Research and Technology and the opinion of the Committee on Public Health and the Environment (Doc. 392/75),
 - having regard to its previous resolutions on the need for a common energy policy and in particular on
 - the proposals from the Commission of the European Communities to the Council for a new energy policy strategy for the European Community¹
 - the proposal from the Commission of the European Communities to the Council for a resolution on the objectives of a common energy policy²,
1. Emphasizes that the problems raised by the increased cost and depletion of certain energy sources can only be solved by advances in technology, in particular by
 - the gradual replacement of present methods, based on the existence of hitherto abundant supplies of cheap energy, by measures and methods whose principal objective is the rational use and saving of energy;
 - the further development of non-conventional methods of producing energy, in particular nuclear power;
 2. Refers in this connection to its previous opinions pointing out that the further development of nuclear energy is absolutely essential to meet the Community's energy requirements and that its energy-dependence could thereby be reduced at the same time;
 3. Considers that the availability of sufficient, secure and cheap energy in the long term - as offered by nuclear energy on the basis of present-day knowledge - is of fundamental importance for people, their lives and their development;

¹OJ No. C 93, 7.8.1974, p.79

²OJ No. C 76, 7.4.1975, p.30

4. Points out, moreover, that the expected complete exhaustion of conventional energy sources further heightens the need to switch to nuclear energy;
5. Recognizes that nuclear energy, like every other energy, involves a certain risk to the environment, but that compared with other dangers to which man and his natural environment are exposed, this risk is so slight as to be acceptable;
6. Points out that the level of energy consumption and thus the extent to which new nuclear power stations are built, is directly dependent on the economic growth rate aimed at by the Member States and the Community and notes that this rule has frequently not been observed by the individual states in drawing up plans for the development of nuclear energy;
7. Feels, however, that although the need for nuclear energy is indisputable, a solid Community framework taking the form of the strict application of suitable regulations should be created to cover the further development of nuclear energy and that this framework should be supervised;
8. Takes the views that in this connection a siting policy for nuclear power stations must be established at Community level as a matter of urgency before a Community map of potential sites is drawn up;
9. Points out to the Commission and the Council of the European Communities that applications for the authorization of nuclear power stations must be harmonized at Community level;
10. Is of the opinion that only by harmonization of authorization procedures and regulations can all the citizens of the Community be given the same guarantees and the same protection;
11. Emphasizes that it is essential for the Community for the provisions of the IAEA (International Atomic Energy Agency) on the transport of fissionable or radioactive materials to be reviewed and improved and for work on a Community programme on waste disposal to be intensified;
12. Calls on the governments of the Member States and the Commission to do all they can to eliminate residual risks as far as possible by introducing new technologies, by adapting research programmes and in particular by strictly supervising and further developing safety regulations;
13. Is of the opinion that, in addition to the criteria applying at present in the selection of sites,¹ more account must be taken of the risks and constraints involved in the transport of radioactive materials;

¹See paragraphs 23 and 24 of the Explanatory Statement

14. Calls upon the Commission of the European Communities to carefully consider and if necessary, further explore the possibilities of establishing 'nuclear parks' and platforms at sea or underground nuclear power plants, whereby the supervision of the nuclear power stations could be reduced and, in the case of 'parks', the problems connected with the transport of radioactive materials minimized;
15. Is of the opinion that the external protection of existing nuclear installations calls for specific and reinforced supervision based on special regulations;
16. Takes the view that, under the Community siting policy, the public must be kept fully informed on the development of nuclear energy and must in all cases be given a clear understanding of the alternatives, which entail an impoverishment of the quality of life;
17. Also emphasizes that, as part of this Community policy, close collaboration with the local and regional authorities ~~nonceDwed~~ is essential in all the Member States;
18. Points out that the problems associated with the construction of a nuclear power plant extend beyond territorial frontiers and that it will therefore be the Community's task to introduce a procedure for making contact with the third countries bordering on the Community and affected by Community measures;
19. Is of the opinion that all parties concerned must be given optimum guarantees, but that the time taken by the procedure for authorizing the construction of nuclear power stations can and must be reduced;
20. Calls upon the parliaments and governments of the Member States to draw up draft legislation, insofar as it does not already exist, that will enable citizens' associations and environmental organizations to use constitutional means in pressing their claims;
21. Calls upon the Commission of the European Communities to revise the Rasmussen report in the light of the research undertaken in certain countries and taking account of the geographical and demographic characteristics of Europe with particular reference to heavy water reactors, and to up-date it by including studies of the latest nuclear technology (fast breeders, high temperature reactors);
22. Notes that the various constraints governing site selection should lead above all to a review of the scope of certain current energy programmes;
23. Takes the view that a thorough investigation is necessary of the problems connected with the use of cooling towers (dry and wet processes), so that areas not having adequate water reserves may also be considered as sites for nuclear power stations;
24. Finally is of the opinion that without the introduction of a harmonized siting policy for nuclear power stations, the development of nuclear power, a Community energy policy and, indeed, adequate energy supplies, are seriously at risk.
25. Instructs its President to forward this resolution and the report of its committee to the Council and Commission of the European Communities.

EXPLANATORY STATEMENTIntroduction

1. The technology of civil nuclear power generation was developed over 30 years ago. While the first nuclear power stations met with little or no opposition from the public, the situation has changed completely with the sudden spurt in nuclear programmes.
2. As a result of the energy crisis, these programmes have been pushed along faster, provoking a debate on the use of nuclear energy and the dangers it involves. Nuclear energy itself has, in fact, been called in question. The safety aspects of this form of energy and its effects on the environment are now being raised on all sides and are used as arguments by its opponents.

But can we do without nuclear energy? For most industrialized countries, the question is no longer worth asking. New forms of energy or measures to combat waste have done so little to meet energy requirements that the use of nuclear energy was and is inevitable.

And it is not only our Member States but the Community itself which has set out on this path. The new energy strategy adopted by the Council provides that nuclear energy will cover 50% of electricity requirements in 1985. With this same object in view, the energy policy for 1985 calls for an installed nuclear power of 200 GWe (Commission) and 160 GWe (Council).

3. Since these decisions have already been taken, can the whole question of nuclear energy be reviewed? Obviously the answer is yes, for the debate goes beyond the objectives for the next ten years; what is at stake is the much more important choice, affecting the period after 1985, between a totally nuclear or partially nuclear capacity.

Here again, the programmes drawn up by some of our Member States suggest that the decision has already been taken at national level. Our committee has always strongly backed the idea of a clearly defined energy policy conducted at Community level. This applies even more to nuclear policy and the fundamental choices which it raises for society.

4. Before these national decisions are purely and simply ratified at Community level, our committee therefore proposes in this own-initiative report to consider an important aspect of nuclear policy which will partly determine whether this form of energy is extended or restricted, viz. the siting of nuclear installations.

5. The purpose of our committee is to lay down guidelines for a Community policy in this matter by analysing the present situation in the Member States. A further related purpose is to determine to what extent the constraints involved in the choice of sites for nuclear power stations may lead to a review of the scope and methods of certain long-term programmes already decided at national level.

6. Faced with the complexity of the problem and the mass of information needed, your rapporteur began by drafting a working document containing the essential facts of the matter with the aid of the Directorate-General for Research and Documentation of the Secretariat of the European Parliament.

The first part of this document reviews the nuclear programmes of certain Member States, the United States and Switzerland, together with the planning permission procedures and the site selection criteria for power stations.

The second part deals with acceptability for the population of the siting of nuclear power stations.

7. On the basis of this reference document, your rapporteur is now submitting to the committee a draft report. It presents a summary of the main arguments in favour of a Community policy on the siting of nuclear power stations.

I. The nuclear programmes of the Member States

8. Well before the energy crisis, most Member States took the view that the large-scale use of nuclear energy would help to solve the problems of the Community's energy dependence. The second outline nuclear programme drawn up by the Commission in July 1972 stressed this point. The Commission regretted at the same time that what had already been done (July 1972) fell short of the objectives of the first outline nuclear programme. The Member States had thus entered the nuclear race well before the energy crisis in October 1973. However, it was not until the crisis broke that the development of nuclear energy became imperative, at least at the planning level.

(a) Nuclear power stations at present in service in the Community and short-term programmes of the Member States

9. The attached working document provides detailed information on the various Member States considered. For a general view, we reproduce below the table supplied by the Commission of the Communities (OJ C 65, 7.6.1974).

Capacity of nuclear power stations in the Community
and a number of third countries¹.

Country/region	1 January 1974		end 1980		end 1985	
	GWe ²	Reactors	GWe	Reactors	GWe	Reactors
Germany	2.3	11	20	30	49	54
France	2.8	10	17.5	28	49	54
Italy	0.6	3	1.4	4	20	23
United Kingdom	5.3	29	11.8	40	16	41
Belgium	0.01	1	3.5	5	9	11
Netherlands	0.5	2	0.5	2	13.5	5
Luxembourg	-	-	1.2	1	1.2	1
Denmark	-	-	0.9	1	3.8	4
Ireland	-	-	-	-	-	-
Community	11.5	56	56.8	111	151.5	193
¹ Latest forecast submitted by the Member States and collated by the Commission						
Other countries of Western Europe	2.4	7	30	42	60	70
United States	26	42	132	150	280	290
Canada	2.5	7	7.5	13	15	23
Japan	3.1	7	32	40	60	65
USSR	2.6	16	15	28	30	40
Eastern Europe (Other)	0.6	3	8	19
² GWe (gigawatts or millions of kW).						

(b) The long-term nuclear programmes

10. While the majority of the Member States have stepped up their nuclear power programme for the next ten years following the energy crisis, some of them have looked beyond this date, making forecasts for the years 1990 and 2000.

For instance, the French nuclear programme, adopted on 4 March 1974, provides for the construction of about 200 reactors in 40 'nuclear power parks' by the year 2000. Compared with the aims for 1985, this would mean the construction of about 140 reactors in 15 years.

The forecasts for Italy indicate an increase in installed power from 26 GWe in 1985 to between 47 and 62 GWe in 1990.

11. This sudden growth in the development of nuclear energy makes it easier to understand the fears aroused in some sectors of public opinion by this sharp increase in the number of nuclear power stations. It also brings out the major importance of siting and planning permission procedures.

II. Planning permission procedures

12. In most Member States, regulations on nuclear installations form part of the legislation concerned with dangerous, unhealthy and/or pollution-causing establishments. The majority of them have inserted in this framework specific provisions on nuclear installations.

13. Rather than repeat here the details given in the attached working document,¹ we shall indicate the broad lines of the planning permission procedures and attempt to derive a model which might be applied at Community level.

(a) Community definition of installations covered by the regulations

14. While the regulations in force in the various Member States show a common pattern (submission of the application to the national authorities - regional consultation procedure - local procedure - opinion of the technical department - final decision at national level), it is apparent, however, that their purpose is viewed and defined in widely different ways.

A first step essential to any subsequent development at Community level would be to harmonize the categories of installation subject to planning permission.

(b) Informing public opinion

15. By this we do not mean the local and regional consultation procedure, even in the form of a public inquiry. On the contrary, we are thinking of the need to keep the general public fully informed at all stages of the entire project and of any problems or difficulties that it raises.

The United Kingdom would seem to be the only country at present where the public is kept informed and involved in a truly satisfactory manner. This kind of approach has amply proved its worth. In this connection, the relevant paragraph in the chapter of the working document concerned with Great Britain is highly interesting and provides a pointer to the system which should be recommended by the Community to all of the Member States.

16. It seems clear that some of the implacable opposition to nuclear energy, which is based on emotional rather than rational considerations would not have attracted so much attention from the general public if the scientific world itself had not remained silent for so long and if the authorities concerned had involved the public from the beginning in the establishment of nuclear power stations.

¹See also Doc. EUR 5284 (1974)

(c) Role of the local and regional authorities in planning permission

17. In all planning permission procedures, there is a stage at which the local and regional authorities affected by the possible construction of a nuclear power station are asked for their opinion. In every case, the role of these authorities or bodies is purely advisory although, in some countries, an unfavourable opinion may force the central authority, in fact although not in law, to abandon the project.

On the other hand, in the majority of our countries, the role of these local bodies is too often a mere formality. Although the regulations specify that the opinion of the local or regional authorities must be obtained, the manner in which the procedure is carried out detracts from its significance and bearing on the matter.

18. It is our contention that, implemented in this way, the procedure is unlikely to serve the interests of nuclear energy. On the contrary, such an approach can only strengthen public opinion and its local representatives in the belief that they are deliberately given no say in a plan agreed at high level from which they stand to suffer.

It is therefore necessary to consolidate and develop this stage of the procedure in order to arrive at a genuine and honest consultation of the local or regional authorities concerned.

19. To take another point, it scarcely seems possible that, seventeen years after the Treaties of Rome came into force, there is no provision for transnational regional consultation whenever the site envisaged is located near an intraCommunity frontier.

As part of the harmonization of the planning permission procedures, the Community should make it obligatory to consult the border regions affected by the construction of a power station.

(d) Level of the final decision

20. Except in the Federal German Republic, where, because of federation, special arrangements apply, the decision to authorize building of a nuclear power station is taken at ministerial or interministerial level, once the various technical departments or bodies concerned have been consulted. Closer scrutiny of the machinery in force at this level of the procedure will show, however, that the differences from one country to another are considerable. Sometimes the final decision lies with the Ministry for the Economy or for Industry, sometimes it is taken jointly by the latter and the Ministry of Health and the Environment or a technical body specializing in problems of nuclear energy, or by all these authorities at the same time.

There are undoubtedly good reasons for all these procedures and it is not clear at first sight which of them, if any, offers greater safeguards.

21. Your rapporteur is of the opinion, however, that a definite line of conduct should be laid down at Community level, not simply to achieve harmonization for its own sake, but to provide all the citizens of the Community with the same guarantees. Your rapporteur believes that this directive should give the Ministry of Health and the Environment, along with the Ministries of Economics and the Interior, the power of co-decision.

Your rapporteur considers it important that the Community should make full use of the powers granted to it in this important field, likewise in the matter of site planning.

30. It is also to be noted that, in its second outline nuclear programme published in July 1972 (Doc. XVII - 341-4-71), the Commission states that the problems of nuclear energy and protection of the environment be covered by a Community or even an international siting policy.

In this same document, the Commission refers to the problem of harmonization of criteria and standards, pointing out that the ultimate objective is a standardized technical basis for the national administrative procedures for authorization to build and operate nuclear installations and to transport radioactive materials (page 41).

31. Your rapporteur is happy to say that the statements made by the Commission tally with the aims of the report. It is regrettable, however, that the Commission has been unable to carry out its intentions.

IV. Conclusions

32. Under normal operating conditions, nuclear power stations and other nuclear energy production centres have not so far proved a greater threat to human life than many other industrial installations. Indeed, the opposite is true.

The recent report by Professor Rasmussen published by the Massachusetts Institute of Technology indicates that for a thousand power stations (a number which may be reached well before the year 2000, since present plans call for the construction of 100 per year throughout the world) an accident causing 100 deaths could occur approximately every thousand years.

There remains the question of whether the method of assessment described in the Rasmussen report carries conviction.

33. Although space projects are an example of advanced technology with a high degree of reliability, accidents have occurred due to factors unforeseen in such analyses. The traditional 'trial and error' approach can rarely be used in nuclear technology, which means that the statistical basis for and hence the reliability of a probability calculation will always be less certain than in other sectors.

34. Apart from breakdowns, the main environmental hazard with nuclear installation lies in the large quantity of actinides, especially plutonium, and fission products.

This latent hazard becomes serious when external factors such as sabotage and military action come into play.

The underground siting of nuclear installations could conceivably reduce this risk considerably. Underground construction not only of nuclear power stations but also of nuclear fuel processing and fuel element production plants (in the case of plutonium) might be desirable.

35. Shipments of radioactive elements have to be protected against air accidents, sabotage and theft. Because of the increase in the number of nuclear installations, effective protection can only be achieved if the number and size of these shipments are kept to a minimum and if the task of implementing the measures adopted for this purpose is assigned to special military or security service units. The problem of secure transport would be eased if it were possible to have nuclear parks consisting of a number of power reactors together with the necessary fuel processing and waste storage facilities. This would also make it easier to prevent too frequent misappropriation of small quantities of fissile material and to check compliance with international regulations.

36. The Community and the Member States must make every effort to resolve the problem of long-lived fission products, especially actinide, an extremely long-lived carcinogenic product, even when such arrangements affect the economic viability of nuclear energy. In particular, installations should be developed, the technical and economic value of which would be subject to assessment, to convert an economically viable quantity of radioactive waste by irradiation into short-lived isotopes, producing stable final products. Finally, priority should be given to those nuclear technologies which, by their nature, present a much lower risk of contamination, for example by actinide.

37. Having regard to its geographical and demographic situation, the European Community should promote research into the long-term possibility of constructing nuclear parks on man-made or natural islands.

38. The Community should undertake a vast public relations campaign on the whole problem of nuclear energy. Europe must make a choice in full knowledge of the facts, especially the employment situation, weighing the risks of a breakdown in energy supplies, dependence on abroad, the stepping up of the nuclear programme, and a slow-down of growth. All the factors involved will have to be singled out and explained, to show that the problem cannot be reduced to a question of the quality of life or economic growth, but that it lies between these two poles; and security of jobs must always be a decisive factor.

For the period after 1985, the question of what a nuclear society is should again be asked.

39. These various Community actions in the utilization of nuclear energy should start with a Community policy on nuclear power station siting; this must first of all comprehensively clarify the question of acceptability for the population in each case.

Apart from the objective reasons which argue for denationalization of the siting problem, it is clear that unless it has authority in the matter the Community will not be in a position to sponsor solutions and provide answers to the problems raised by nuclear energy, which are all connected with site choice, whether they precede or follow it.

OPINION OF THE COMMITTEE ON PUBLIC HEALTH AND THE ENVIRONMENT

Draftsman : Mr A. PREMOLI

On 1 October 1974, the Committee on Public Health and the Environment appointed Mr Petersen draftsman.

On 2 October 1975, Mr Premoli was appointed to replace Mr Petersen, the latter having left the European Parliament.

It considered the draft opinion at its meetings of 30 June, 2 and 20 October and 20 November 1975.

On 20 November 1975 it unanimously adopted the draft opinion.

Present: Mr Della Briotta, chairman; Mr Spicer, vice-chairman; Mr Premoli, draftsman of the opinion, Lord Bethell, Lady Fisher of Rednal, Mr Liogier, Mr Martens, Mr Meintz, Mr Noé, Mr Radoux (deputizing for Mrs Orth) and Mr Rosati.

I. INTRODUCTION

1. One task for the specialist is to obtain a clear picture of the knowledge so far acquired of the consequences of ionizing radiations on the environment and public health.

Whenever political decisions have to be taken in the respective countries they should be based on a balance of advantages and disadvantages. At the present time it is not possible to determine this balance precisely in quantitative terms but the decisions must be based on premises which are as clear as they can be at the time. People's attitudes towards nuclear energy are at present determined to a great extent by their confidence in statements made about its advantages and/or disadvantages.

2. In its report on the outcome of the Third International Parliamentary Conference on the Environment held in Nairobi on 8-10 April 1974 (PE 38.306) the Committee on Public Health and the Environment supported the appeal made by the Conference to all governments to give priority to protection of the environment whenever serious conflicts arise between energy production and environmental quality, and the committee has requested the Commission and the Council of the European Communities to adopt this principle as well.

3. Assuming that environmental protection is a matter of priority the Committee on Public Health and the Environment wishes to report on the consequences of nuclear energy for the environment since one condition for the construction of any nuclear power station should be public awareness of the consequences, which must be taken fully into consideration.

The Committee on Public Health and the Environment would also support the ideas on the creation of a Community energy policy for the period until 1985 expressed in many of Parliament's reports. However, the Committee on Public Health and the Environment believes that the people of the Member States will only accept an alternative source of energy such as nuclear power if they can be confident that governments will give maximum priority to environmental protection when nuclear power stations are constructed.

4. The Committee on Public Health and the Environment also wishes to stress that restrictions on the level of pollution from individual nuclear power stations should be related to a general policy.

The number of nuclear power stations now being planned worldwide is such that there must be limitations on the overall level of environmental pollution. This means that more rigorous restrictions must apply to the level of radioactive emissions from each power station than only a few years ago, when only a small number were operative.

There must be Community action on nuclear energy, both as regards siting and pollution levels.

Nor should nuclear power stations be sited in frontier regions of the Community without prior consultation with the government of the neighbouring country. It may prove possible, through conventions with third countries, to arrive at an overall nuclear energy policy offering maximum protection, for the whole of Europe.

II. GENERAL OBSERVATIONS

5. In its preliminary report on the problems of pollution and nuisances originating from energy production (SEC(74) 1150 fin.) the Commission notes that the siting of installations for the production, transformation and transport of energy under its various forms requires increasing attention in order to protect the environment against the pollution and nuisances caused by these installations.

Mr NOE's report on this preliminary report (Doc. 320/74) also notes that it is appropriate to draw up careful plans for the development of electric power stations in the Community.

6. During the last 50 years the consumption of electricity has increased rapidly. This increase is due mainly to an increase of consumption per capita of the population and there are as yet no indications that there will be a falling-off in the next few decades however much this may be desired.

In view of the limited world reserves of coal, oil and natural gas a large part of the increased requirements will consequently have to be covered by nuclear power.

7. The Committee on Energy, Research and Technology decided last year to draw up an own-initiative report on the conditions for a Community policy on the siting of nuclear power stations.

The Committee on Public Health and the Environment was authorized by the Bureau of the European Parliament to prepare an opinion for this report containing an examination of the extent to which the siting of nuclear power stations can affect public health and the natural environment.

8. Apart from the above-mentioned report by Mr NOE, the Committee on Public Health and the Environment has submitted a number of other reports to the European Parliament relating to the problems to be considered here.

In 1974 Mrs WALZ reported on the proposal from the Commission of the European Communities to the Council for a directive to amend the directives laying down basic safety standards for the health protection of the population and workers against the dangers of ionizing radiations (Doc. 387/73).

In the course of the present year reports by Mr NOE on the proposal from the Commission of the European Communities to the Council for a decision on a programme on radio-active waste management and storage (Doc. 23/75) and by Mr W. MÜLLER on the communication from the Commission of the European Communities to the Council on technological problems of nuclear safety (Doc. 49/75) have been adopted by this committee.

The programme on radio-active waste management and storage has now been adopted by the Council (on 26 June 1975) and a start has already been made on work connected with it.

9. Mr LAMY, representing the Commission, stated during a meeting of the Committee on Public Health and the Environment on 30 June 1975 that the Commission was evolving a number of initiatives which should provide siting criteria.

The criteria should be based on the following factors, none of which should be regarded as absolutely paramount:

- economic: siting in relation to the electricity grid and centres of electricity consumption;
- social: siting related to population density and development planning;
- safety: protection of people and environment against possible radioactive releases during normal operation of power stations or in the event of accidents when they are being closed down;
- technical: type, size and capacity of power stations, ancillary plants and waste removal;
- environmental: changes in water flows, noise and disfiguring of the landscape, influence on local climate.

10. The siting of nuclear power stations nevertheless continues to cause public concern, not least because of the risk of radiation from radioactive waste in transport or storage and from redundant power station components.

It is therefore urgently necessary for the Commission to launch an objective information campaign at European level in order to dispel negative, frequently over-subjective attitudes, and give a clear picture of the economic and environmental factors involved.

III. DISCUSSION OF THE PROBLEMS

A. Introduction

11. The Committee on Public Health and the Environment has to give its opinion on the effect of the siting of nuclear power stations on public health and the environment.

12. Recently there has been greatly increased interest in comparing the environmental aspects of nuclear-fuelled and fossil-fuelled power plants. This comparison is complicated by three factors.

Firstly, the environmental aspects concerned belong to different categories. Apart from those effects which are damaging or prejudicial to public health, there is the damage to agriculture and horticulture, stock-breeding and fishery, or, more generally speaking, the detrimental influence on biological processes in nature.

Then there are differences in pollution of the environment by different kinds of non-nuclear and nuclear thermal power stations. One example of this is the difference in the air pollution caused by coal and oil on the one hand, and natural gas on the other. The burning of natural gas forms only nitrogen dioxides whilst the other two also generate sulphur dioxides, fly ash and soot.

Thirdly, this comparison should also cover the whole process from the extraction of energy materials to the ultimate destination of waste. In the case of nuclear power, the greatest precaution is required in connection with the reprocessing of irradiated fuel and the storage of radioactive waste.

B. Protection of the population and the environment against radioactive radiation

13. There is no doubt that the accumulated radioactive potential in a nuclear power station represents a large source of radiation. Nuclear power stations should thus be so constructed that any uncontrolled radioactive release in the event of an accident or closure or even during normal operation should not exceed a previously fixed limit.

14. The national and international safety standards drawn up to counter accidents and environmental pollution by ionizing radiations are based on the recommendations of the International Commission on Radiological Protection (ICRP). The ICRP recommendations are formulated for three categories of person, namely adults who are exposed in the course of their work to ionizing radiation, certain critical groups, and individual members of the population.

15. The radioactive release may be in gas or liquid form, and may reach living organisms externally or internally.

It should also be pointed out that there is still a risk of radiation from power stations which are no longer operational.

16. Chapter III of the Euratom Treaty which deals with health and safety, describes how the health of workers and the general public should be protected against the dangers arising from ionizing radiations. The directive of 2 February 1959 laying down the basic standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation, which has been amended and adapted on several occasions in line with research results, lays down the methods and criteria necessary to implement the provisions of Chapter III of the Euratom Treaty.

17. During this century, large-scale efforts have been made to clarify the effect of ionizing radiations on human organisms. Ionizing radiation is therefore one of the most thoroughly analysed factors in the human environment.

The dramatic consequences of Hiroshima and Nagasaki have given us some idea of the effect of radioactive releases; our knowledge has also been increased by accidents which have occurred during medical treatment or in nuclear power stations. Finally, a very large proportion of the results have been obtained from tests with animals. It is considered unlikely at the present time that new unknown types of radiation effects will be discovered.

18. The various sources of radiation to which the public in general is exposed at present are, in order of importance:

- medical treatment;
- military nuclear tests;
- natural radiation from the earth and the universe;
- operation of nuclear power stations and ancillary plants.

At the present time, the operation of nuclear power stations and ancillary plants is responsible for less than 1% of total radioactive radiation to which man is exposed.

In order to ensure that this figure does not increase in future despite increased use of nuclear energy, a number of conditions for the operation of nuclear power installations should be laid down, applied and supervised.

The public must be fully reassured that the authorities have worked out effective contingency plans in the event of an accident occurring in a nuclear power station in spite of all precautions. These may take the form of plans for evacuation, preventive medicine distribution programmes, etc.

19. One aspect of the nuclear power station is that, unlike conventional installations, it continues to be a potential danger to the environment for a considerable time after it has been closed down. Parts of the plant will have become radioactive and must on no account be entrusted to natural processes such as corrosion or other normal processes of decay. Full safeguards against radiation must obviously apply up to the time of the closure of any nuclear power station and plant must subsequently be sealed off or dismantled, whereupon all contaminated components must be cleansed or stored so that they do not constitute a threat to the environment.

We must therefore seek information about planned dismantling operations, with particular regard to the large 1000 MW plants. Such plans must state accurately how long a disused nuclear power station is to be left intact and how long it would take to dismantle it. Full details must also be given about the equipment and technology used in dismantling operations.

C. The environmental aspects of nuclear power stations

20. Apart from the immediate dangers to human beings of radioactive release, there are other serious problems connected with nuclear power stations such as the problem of radioactive waste, the transport of nuclear materials, the discharge of waste heat, the influence on fauna and flora and the changes in the quality of the landscape. The environmental consequences of most of these side-effects can only be judged locally, so that it is difficult to lay down universal criteria.

(i) Radioactive waste and transport of nuclear material

21. In the course of this report, mention has frequently been made of radioactive wastes in gaseous, liquid and solid form.

The dangers arising from gaseous and liquid wastes are the most direct since they are released at different stages of nuclear power production, from the extraction of the raw materials to the radiation which is still being released after the power stations have stopped working.

22. It is easier in every case to keep an eye on solid wastes. Here reference should be made to the proposal from the Commission to the Council for a decision adopting a programme concerning the management and storage of radioactive waste (Doc. 475/74).

In the report by Mr NOE' on this proposal, the Committee on Public Health and the Environment urges the Commission to submit practical proposals as soon as possible.

The problem of removal and storage of radioactive waste should be a factor in the choice of the site of nuclear power stations.

An explanatory note on the very important problem of radioactive waste by the Environment and Consumer Protection Department of the Commission is annexed to the present document.

23. The working document by Mrs WALZ, rapporteur for the Committee on Energy, Research and Technology, refers to the dangers inherent in the transport of nuclear material (PE 40.748/fin., part two, paragraphs 3 and 4).

The Committee on Public Health and the Environment shares the anxiety expressed by the committee responsible and therefore proposes that the Commission should consider setting up a European agency specializing in the transport, storage and destruction of radioactive materials.

It also favours setting up a Community network of storage sites for different types of nuclear waste. Because of the risks involved, and to keep supervision costs down, the waste materials should be stored in as small a number of sites as possible.

In view of the nature of the studies required and the concentrations of dangerous substances under constant supervision, the setting-up of a storage network of this type is clearly an environmental responsibility.

The dangers involved in the transport of radioactive materials can be reduced by introducing a form of vertical integration in the nuclear sector. This idea is also envisaged in the report of the committee responsible.

The Committee on Public Health and the Environment can agree with the proposal to locate nuclear power stations, production plant for fissile material and nuclear fuels, as well as storage sites for radioactive wastes, in nuclear complexes, on condition that the local population and environment are fully protected against the accumulated radioactivity.

Finally, the committee points out that the present capacity for re-processing the irradiated fuel produced in operational power stations will be inadequate in the 1980's; in this connection, it calls for action to be taken to increase this capacity in good time. This should be done in order to avoid the dispersion of the irradiated fuel in a large number of provisional storage sites and in order to have available, after reprocessing, the quantities of unused uranium and plutonium contained in radioactive waste which will make it possible to save nuclear fuel.

(ii) Waste heat

24. One important aspect is the problem of waste heat, although this is not specific to nuclear power stations. According to the second law of thermodynamics, only part of the calorific energy can be converted into electrical energy and the rest must therefore be discharged into the environment.

A power station equipped with a light-water reactor requires approximately 1.7 times the condenser cooling capacity of a modern fossil-fuelled power station since the latter is more efficient and discharges part of its waste heat through the stack. The difference is smaller in the case of gas-cooled reactors and there is no appreciable difference for fast reactors where the thermodynamic efficiency is still higher.

25. The choice of a site depends on the availability of sufficient quantities of cooling water. It should be noted that, for environmental reasons, it is not possible for an infinite number of power stations to draw on the same source of cooling water, as each one inevitably causes a rise in the temperature of the body of water affected.

This rise influences the natural life in and around the water-courses it affects.

The use of wet or dry condenser towers can prevent excessive local rises in temperature in the recipient milieu (freshwater or seawater).

(iii) The aesthetic consequences or changes in the quality of the landscape

26. The visual effect of a nuclear power station on the landscape is very much more difficult to quantify than the consequences of radioactive release and thermal discharge and the assessment of criteria is consequently somewhat subjective.

The Committee on Public Health and the Environment nevertheless feels that in addition to socio-economic and environmental considerations, possible changes in the quality of the landscape should be a major factor in determining the location of a nuclear power station.

27. The authorities responsible for siting policy should therefore, in every case, examine to what extent the physical presence of a nuclear power station would influence the skyline, the relief topography of a certain site, natural growth, etc.

(iv) Influence of radioactivity on fauna and flora

28. In the man/radioactivity relationship, animals and plants play the part of carriers. It is therefore necessary to ascertain the 'carrier' characteristics of these living organisms and the way in which they come into contact with humans.

29. In this connection, it is very important that the specialists should have a clear idea of:

- (1) the climate: it is very important to know to what extent and in what way gaseous releases will disperse or fall back to earth;
- (2) water movements: it is possible to form some idea of the path taken by liquid releases;

- (3) soil composition: provides information on the presence of tracers in the soil;
- (4) water use: information on the position of water sources for irrigation, fishing, boating and human consumption provides indications of whether people come into contact with this water;
- (5) land used for agriculture: the production of crops and animals destined for consumption.

30. The study of such problems has not advanced very far, but is very important for large groups of the population, even if they live at some distance from the power stations, in view of the fact that contaminated foodstuffs may spread radioactive contamination over relatively large distances.

IV. RESUMÉ

31. This opinion is based simply on some factors which we consider to be of importance for public health and the protection of the environment, and which should be taken into account in the formulation of a Community policy for the choice of sites for nuclear power stations.

32. The choice of a site for a nuclear power station is a complicated process in which many different kinds of problems must be taken into account.

Two fundamental requirements, the safety and the economic viability of such installations, are preeminent. The first of these is a 'sine qua non'.

The Committee on Public Health and the Environment takes the view, moreover, that priority must be given to the protection of the environment, in accordance with the outcome of the Third International Parliamentary Conference on the Environment held in Nairobi in 1974.

33. The effect of radioactive substances on the environment is a problem connected specifically with the production of nuclear energy.

Radioactive radiation can reach human beings as well as vegetable and animal life at various stages, i.e. the reprocessing and storage of fuel, nuclear fission and the formation and storage of radioactive waste, and through various different media (air, water and soil).

Account should also be taken of groups of people living at some distance from the nuclear power stations who may be affected by eating foods which have been contaminated by radioactivity.

34. The present generation of nuclear power stations requires large quantities of cooling water which cannot be extracted from rivers or the sea without risk to animal and plant life. This in itself restricts the choice of possible sites.

Larger quantities of waste heat are discharged by nuclear than by fossil-fuelled power stations and released by evaporation, radiation and convection into the atmosphere, influencing the natural environment.

35. Apart from the two disadvantages of nuclear power stations, i.e. radioactivity and increased waste heat, they do provide electricity without causing much air pollution, in contrast to fossil-fuelled power stations.

36. In determining the location of a nuclear power station, the effect it will have on the quality of the landscape must also be taken into consideration. A group of experts should be made responsible for ensuring that installations are constructed in such a way that as little damage as possible is done to the natural environment and the landscape.

37. To ensure that public safety is fully guaranteed, nuclear power stations and ancillary installations, as well as arrangements for the transport of radioactive materials, must conform to fixed safety standards.

The latent danger from nuclear power stations that have been shut down should be taken into account at the planning stage.

38. The public can only be expected to adopt a positive view of nuclear energy if it is fully and objectively informed of its implications, of the effects of possible accidents and of how these effects can be kept to a minimum.

V. CONCLUSION

39. The Committee on Public Health and the Environment is not opposed to the location of nuclear power stations at specific sites in the Community, provided a number of conditions are observed;

- the establishment of a nuclear power station at a particular site must be necessary to the energy supply situation and must be socially and economically acceptable;
- a Community siting programme, giving priority to the safeguarding of public health and the environment should be evolved;
- to safeguard public health and the environment, the general radiation standards in force should be regularly adapted in the light of progress made in research and technology, and separate checks made on each installation to determine whether it conforms to these standards;
- special care should be taken in the transport of radioactive materials and the storage of wastes;
- contingency plans for the evacuation in the event of an accident should be drawn up and publicized;

- the following environmental criteria should be observed:

- (1) the micro-climate of the area chosen should not be subjected to significant changes;
- (2) the water economy must not be disrupted;
- (3) fauna and flora must not be harmed;
- (4) changes in the landscape must not amount to a deterioration in quality.

40. In view of the above, the Committee on Public Health and the Environment requests the Committee on Energy, Research and Technology as the committee responsible to take account of the following observations:

- In order to give the public the opportunity to form an objective assessment of the advantages and disadvantages of nuclear power, a large-scale information drive should be carried out under the supervision of the Commission.
- In view of the widespread public concern about radioactive waste, the Commission should be urged to set up as soon as possible an agency specialized in the transport, storage and destruction of radioactive waste.
- The Commission of the European Communities should continue its investigations into the effects of the production of energy by nuclear means on public health and the environment, but at the same time, it should cooperate in the development of the 'new' sources of energy - the sun, tides and winds - which represent, as far as is known, a minimal threat to the public and the environment.
- Only a Community policy, if necessary in cooperation with third countries, can keep the effects of nuclear energy production on public health and the environment to a minimum.

EXPLANATORY NOTE ON RADIOACTIVE WASTE
DRAWN UP BY
THE ENVIRONMENT AND CONSUMER PROTECTION DEPARTMENT
OF THE COMMISSION OF THE EUROPEAN COMMUNITIES

The considerable rise in petroleum product prices, together with the threat of restriction of supply by the producer countries (since their currently identified reserves could be exhausted within one or two generations) have prompted national authorities to seek alternative energy sources. All the Community countries have opted, to a greater or lesser extent, for the development of nuclear energy programmes.

It is a characteristic of this source of energy that any waste which, in whatever manner, might have come in contact with radioactive substances, must be treated as radioactive waste. The problem then rises of dealing with large volumes of waste, of widely varying physical and chemical properties, which are frequently only very weakly radioactive. It is made more amenable by the fact that, whether arising from the manufacture or utilization of nuclear fuel, radioactive waste is principally located on relatively few sites.

Sources of radioactive waste

There are many sources of radioactive waste, but most of them produce residues with a radioactivity not exceeding the natural level of radiation detectable, for instance, in granitic formations.

Thus, uranium-bearing soils have only a small content of uranium ore and its extraction results, as in the case of coal, in large volumes of deads. These, though they contain radium in the form of insoluble sulphate, are characterized by totally harmless radiation levels.

Similarly, the processing of the ore or of fuel elements from natural or enriched uranium, produces slightly contaminated wastes (gaseous, liquid or solid) but the toxicity of these is no greater than that of other heavy metals for which safe methods have long been worked out.

Some radioactive products are 'produced' in the nuclear power stations themselves. These are, of course, the irradiated uranium rods, which after they have become spent, are sent to the reprocessing plant. But in addition to this primary material, there is in a reactor a whole, highly varied, range of radioactive substances generated in the structural materials themselves.

It is impossible to indicate exactly the quantity of radioactive waste produced by a nuclear power station. The amount of solid waste, of various degrees of contamination, produced in a reactor may range from 10 to 100 cu.m.

per year, depending on the reactor type, its structure, the operating conditions and certain site characteristics.

Finally, the principal source of radioactive waste in the nuclear power industry is the plant for the reprocessing of fuel elements which have been irradiated in the reactor core. It should also be remembered that the level of radioactivity in waste produced by the reprocessing centres (within the European Economic Community only two such centres operate on an industrial scale : La Hague in France and Windscale in the United Kingdom) is much higher than the total radioactivity of waste materials from the remaining sources listed above.

The reprocessing consists in the recovery by chemical means of the unconverted uranium and of the plutonium produced by irradiation, by their separation from the fission products. This is done by dissolving the irradiated fuel in acid.

A reprocessing plant produces the following types of radioactive waste :

- gaseous effluents produced during the dissolution of the fuel;
- fission products;
- waste from the purification of the solvents for uranium and plutonium;
- solid waste;
- liquid effluents from maintenance and decontamination operations.

Treatment and disposal of radioactive waste

It should be emphasized again that a certain amount of radioactive waste has a low level of activity, close to that of granite, and could be disposed of in the environment without treatment.

The processing methods for more active waste depending on circumstances, include one or more of the following :

- separation of highly radioactive and low activity components;
- conversion of the waste into the solid state to facilitate its safe handling and temporary or final storage;
- reduction of volume.

In describing below the methods used for various types of radioactive waste, a distinction will be made, whenever necessary, between waste from nuclear power stations (generally low-activity) and that from reprocessing installations (highly radioactive).

1. Solid waste

Low-activity solid waste is usually sorted, processed and packaged before being removed and stored. Crushing or incineration is used to reduce volume,

with suitable filtration of the combustion gases. In addition, the system of embedding waste in cement or asphalt containers has now reached the full development stage. Waste is stored in underground or overground enclosed spaces (to protect the waste from the elements), or in the open, in cement-lined trenches. The waste can also be buried in the soil at varying depths, in specific geological formations, or dumped on the high seas at great depths.

2. Liquid waste

There are several methods for the treatment, preliminary to storage on land, of liquid waste with a low or medium level of radioactivity.

The most serious problem however, is posed by the treatment of highly radioactive liquid waste from reprocessing installations, that is, of solutions containing fission products.

This type of highly radioactive waste is stored provisionally in liquid form on site, in special reservoirs provided with cooling equipment and enclosed in concrete silos. This, however, can only be an interim answer, because, as we know, it will take hundreds of years for this waste to be reduced by radioactive decay to a harmless level of activity, and some elements present in trace quantities, such as plutonium, will remain radioactive for hundreds of thousands of years.

This is why considerable hopes attach to research on solidification processes, such as the vitrification process now being developed in the Community. The materials could be satisfactorily stored forever in saline or clay soils having high geological stability and impermeability. At present these vitreous slabs are enclosed in steel containers and stored on site in cement-lined wells. (The total accumulation in the European Community is estimated to reach 13,000 cu.m. in the year 2000).

Low-activity liquid waste produced in reprocessing plant is subjected to treatment to separate the radioactive materials from the mother liquor which can be discarded. A number of disposal systems are either being studied or already in operation. Discharge into the ground, into streams, rivers and estuaries, and especially, into coastal waters (this is the case at Windscale and La Hague) are examples of some of the solutions that have been found after appropriate ecology radiation studies and the application of international standards and regulations.

3. Gaseous waste

In gaseous discharges, the radioactive component can have the form of dust, smoke, vapour or gas.

Frequently, dispersion and dilution in the atmosphere prove sufficient, especially for the inert gases which are not contaminating in themselves. But if it is necessary to purify some of the gases used in the industry before they are discharged, different types of equipment are used, depending on the type of the aerosol to be treated and the degree of decontamination required.

In the recovery plant, special equipment is used as part of the process to retain the volatile fission products released in gaseous form during the decanning and dissolving of the irradiated fuel elements.

So far the atmospheric discharge of gaseous effluents has not presented any particular radiological safety problems, but, with the proliferation of light-water reactors and the development of fast-neutron reactors, the question of gaseous effluents from recovery plants is likely to reach proportions which will justify the research now being done on their abatement.

Research and development to be carried out on a Community scale

The preceding survey of radioactive waste, to which in the coming decades will have to be added radioactive materials from the demolition of decommissioned nuclear power stations (their estimated average useful life is about 25 years) may seem formidable, but should not be intimidating. The fact is that the volume of the material to be stored will present no technical problem; the amount of radioactivity which the waste may produce is kept very strictly below natural radioactivity levels and storage methods are chosen so as to prevent any risk of contamination.

Since the beginning of the nuclear era the nuclear industry has made prodigious efforts to develop fool-proof processing methods, develop the requisite technologies, and carry out highly advanced research on the environmental implications.

It seems obvious that in the matter of radioactive waste, the central problem of highly radioactive materials should be rapidly made the subject of detailed consideration and of research and development work.

Effectively, this is a moral question of general concern, namely, whether we have the right to continue the production, storage or disposal

of waste, having in some cases a radioactive life of several thousand years, when we neither know nor can measure its practical effects upon many generations of human beings.

The programme for the development of nuclear power stations will generate a growing quantity of radioactive waste which will have to be processed and stored. The ideal solution would be to find a safe and convenient method of ultimate disposal. This might be provided by the transformation of long-life waste either into short-lived waste or directly into stable non-radioactive products.

The Commission of the European Communities, in an endeavour to contribute to the solution of the radioactive waste problem, has proposed a Community multiannual programme on the management and storage of such waste. The programme was accepted by the Council on 26 June 1975 and work on it is already commencing.

