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DOCUMENT 473/78

Report

drawn up on behalf of the Committee on Energy and Research

on the proposal from the Commission of the European Communities to the Council (doc. 126/78) for a Decision adopting a programme concerning the decommissioning of nuclear power plants

Rapporteur: Mr. G. FLAMIG

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English Edition

By letter of 10 May 1978 the President of the Council of the European Communities requested the European Parliament to deliver an opinion on the proposal from the Commission of the European Communities to the Council for a decision adopting a programme concerning the decommissioning of nuclear power plants.

The President of the European Parliament referred this proposal to the Committee on Energy and Research as the committee responsible and to the Committee on Budgets and the Committee on the Environment, Public Health and Consumer Protection for their opinions.

On 18 May 1978 the Committee on Energy and Research appointed Mr Flämig rapporteur.

It considered this proposal at its meetings of 19 October 1978 and 23 November 1978.

At its meeting of 23 November 1978 the committee unanimously adopted the motion for a resolution and the explanatory statement.

Present: Mrs Walz, chairman; Mr Flämig, vice-chairman and rapporteur; Mr Veronesi, vice-chairman, Mr Bertrand (deputising for Mr Blumenfeld); Mr Covelli; Mr Edwards; Mr Fioret; Mr Fitch; Mr Fuchs; Mr Ibrügger; Mr Lamberts; Mr Liogier; Mr McDonald (deputising for Mr Ripamonti); Mr Mitchell; Mr Noè; Mr Power; Mr Vanvelthoven; Mr Vergeer and Mr Verhaegen.

The opinions of the Committee on Budgets and the Committee on the Environment, Public Health and Consumer Protection are attached.

C O N T E N T S

A

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

MOTION FOR A RESOLUTION

embodying the opinion of the European Parliament on the Proposal from the Commission of the European Communities to the Council for a Decision adopting a programme concerning the decommissioning of nuclear power plants

The European Parliament,

- having regard to the proposal from the Commission of the European Communities to the Council[1],
- having been consulted by the Council (Doc. 126/78),
- having regard to the report of the Committee on Energy and Research and the opinions of the Committee on Budgets and the Committee on the Environment, Public Health and Consumer Protection (Doc. 473 /78),
- having regard to its resolutions
  - on the communication from the Commission of the European Communities to the Council on technological problems of nuclear safety[2]
  - on measures to be taken in connection with the removal of radioactive waste as part of Community energy policy and on the proposals from the Commission of the European Communities to the Council for
    - a draft Council resolution on the implementation of a Community plan of action in the field of radioactive waste
    - a draft Council decision on the setting up of a high-level committee of experts responsible for assisting the Commission in the implementation of the plan of action in the field of radioactive waste
    - a draft Council decision on the setting up of an ad hoc committee for the reprocessing of irradiated nuclear fuels[3],

1. Congratulates the Commission of the European Communities on its initiative in proposing a programme for the decommissioning of nuclear power plants;
2. Believes that decommissioning, like other aspects of nuclear development, lends itself to a Community approach;
3. Feels that the development of satisfactory decommissioning techniques could help to make nuclear power more acceptable to those who are at present hesitant;

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[1] OJ No. C 146 of 21.6.1978, page 3

[2] OJ No. C 128 of 9.6.1975, page 24

[3] OJ No. C 85 of 10.4.1978, page 46

4. Calls on the Commission to elaborate Community norms for the decommissioning of nuclear installations, and to ensure that installations are so constructed as to be not only amenable to repair, but capable of being dismantled without undue complications;

5. Notes that considerable work in the field of decommissioning has already been carried out in the Community, and is aware of the need to adapt the experience already acquired to the decommissioning of large nuclear power stations;

6. Notes with approval that the programme may be submitted for amendment at the end of the second year, and trusts that the European Parliament would be reconsulted in the event of such amendment;

7. Approves the proposal for a Council decision adopting a programme concerning the decommissioning of nuclear power plants subject to the adoption by the Commission of the following amendment pursuant to Article 149, second paragraph, of the EEC Treaty.

TEXT PROPOSED BY THE COMMISSION OF THE EUROPEAN COMMUNITIES[1]	AMENDED TEXT
Proposal for a Decision adopting a programme concerning the de-commissioning of nuclear power plants	
Preamble unchanged	
Article 1 unchanged	
Article 2	Article 2
The expenditure commitments necessary for the implementation of this programme are estimated at 6.38 millions European units of account (EUA) with a staff of five.	The upper limit of expenditure commitments necessary for the implementation of this programme is estimated to be 6.18 European units of account (EUA), as defined in Article 10 of the Financial Regulation of 21 December 1977, and the staff is estimated at four. These figures are of an indicative nature only.
Article 3 unchanged	
Annex unchanged	

[1] OJ No. C 146 of 21.6.1978, page 3

B

EXPLANATORY STATEMENT

I. INTRODUCTION

1. Twenty nuclear installations have already been taken out of service in the non-Communist world. Five of these were in Community countries. Thus a body of experience has been acquired in this field. There is, however, need for further work on decommissioning, as all of these installations, were either small, or else had only been used for short periods, consequently having a relatively low level of radioactivity. Moreover, none of these has been dismantled.

2. The Commission has now proposed to the Council a Research and Development programme aimed at enlarging our appreciation of the problems involved in decommissioning nuclear power stations

II. THE COMMISSION'S PROPOSAL

3. According to the Commission's document decommissioning can be divided up into the following three main stages:

Stage 1 decommissioning (Sometimes called 'mothballing')

The plant is practically kept intact. The mechanical opening systems (valves, plugs, etc.) of the first contamination barrier are permanently blocked and sealed. The plant is under surveillance and inspections are carried out to check that it remains in good condition.

Stage 2 decommissioning (sometimes called 'Entombment')

The primary contamination barrier is reduced to minimum size and sealed, removing all parts which can be easily dismantled. The biological shield (e.g. concrete) is extended so that it completely surrounds the barrier.

After decontamination to acceptable levels, the contaminated building can be removed. The other parts of the plant (buildings or equipment) can be dismantled or converted for new purposes. Surveillance around the barrier is necessary, but can be relaxed as compared with Stage 1. External inspection of the sealed part should be performed.

Stage 3 decommissioning (sometimes called complete removal)

All remaining parts of the plant, the radioactivity of which remains significant despite decontamination procedures, are removed. The plant is then released without restrictions. No surveillance or inspection is necessary from the point of view of radiological protection.

4. Of the five nuclear stations already withdrawn from service in the Community, only in the HDR reactor (in the Federal Republic of Germany) has the work of decommissioning been carried beyond the first stage. However, the Community has acquired additional experience through the removal of heavy components in certain nuclear installations, notably the pressurised heavy water reactors at Trino Vercellese and Chooz.

5. Moreover, decommissioning has been taken into account by planners and builders of nuclear power plants for several years, and detailed studies have been carried out on those installations that have already been withdrawn from service. As well as power stations, experience has been gained from the decommissioning of research reactors and fuel cycle installations: the dismantling of the Le Bouchet uranium fabrication plant (France), the dismantling of a small prototype reprocessing plant at Fontenay aux Roses (France) and through extensive decontamination operations at three reprocessing plants (Mol in Belgium, Dounreay in Britain and Trisaia in Italy).

6. In order to build on this experience, to acquire new knowledge and to face up to the problems posed by larger scale decommissioning of important commercial installations, the Commission has proposed a R & D programme which would be divided up into the following actions:

Action No. 1: Long term integrity of buildings and systems
Action No. 2: Decontamination for decommissioning purposes
Action No. 3: Dismantling techniques
Action No. 4: Treatment of specific waste materials : steel, concrete and graphite
Action No. 5: Large transport containers for radioactive waste produced in the dismantling of nuclear power plants
Action No. 6: Estimation of the quantities of radioactive wastes arising from the decommissioning of nuclear power plants in the Communities
Action No. 7: Influence of nuclear power plant design features on decommissioning.

7. These research projects are interesting for two reasons:

- the knowledge obtained from the above projects will further assist the design of nuclear power stations so as to make decommissioning easier;
- the main principles which will emerge from these research projects may possibly constitute the basis of a Community policy in the field of decommissioning.

Financial considerations

8. The overall cost of the programme is expected to be in excess of 10m EUA, of which 6.38m EUA would come out of the Community budget. The remainder would be provided by public and private organisations in the Member States.

9. In the Preliminary Draft General Budget of the European Communities for the financial year 1979 the Commission requested 996,000 EUA in payment and 2,296,000 in commitment appropriations for this action. As it had not yet been approved by the Council, these allocations were replaced in the Draft Budget by a token entry in Chapter 33 and 500,000 EUA in payment and commitment appropriations in Chapter 100. The Committee on Energy and Research has proposed that the sums originally requested by the Commission be reinstated in Chapter 33, while deleting the 500,000 EUA in payment and commitment appropriations entered by the Council in Chapter 100. This would enable the programme to come into operation during the financial year 1979.

10. For this action the Commission has requested the following staff - 2 Grade A officials, 2 Grade B officials, 1 Grade C official. This is considered in the section headed 'comments on the Commission's proposal'.

III. COMMENTS ON THE COMMISSION'S PROPOSAL

11. The proposal presented by the Commission appears to be particularly comprehensive.

12. Evidently considerable research has gone into this proposal which, by virtue of its technicality, is difficult for the Committee to assess. Nevertheless it appears to be a carefully thought-out, thoroughly prepared document.

13. As a political principle the Committee on Energy and Research congratulates the Commission on having taken this initiative which could be of great importance for the development of nuclear power. Decommissioning, like other aspects of nuclear development, lends itself to a Community approach and, ultimately, Community norms for decommissioning and dismantling should be worked out. An earlier report[1] drawn up by your rapporteur and adopted by the European Parliament requested the Commission "to extend its field of action to the problems associated with the decommissioning of nuclear power stations with a view to defining an appropriate Community strategy". Moreover, decommissioning is one of the issues with regard to nuclear energy that most worries public opinion, so the development of satisfactory techniques for decommissioning could make nuclear power more acceptable to those who are at present hesitant.

14. Particularly important is the fact that already over the past decade nuclear power plants in Germany, Britain, France, Italy and other Community countries have been designed and built so as to be more amenable to repair, dismantling and decommissioning. A great deal of work has been carried out in this field, including detailed studies in France, Germany and the United Kingdom. The Commission's document must not be interpreted as implying that this problem has only begun to be tackled recently in the Community. At all events we consider that further research work in this field is both useful and necessary in order to facilitate the exchange of information and experience in this field and to coordinate research, thereby avoiding duplication of effort.

15. According to information provided by the Risley Nuclear Power Development Establishment of the United Kingdom Atomic Energy Authority a major nuclear fuel reprocessing plant at Dounreay has been refurbished to reprocess plutonium fuel from the prototype fast reactor. To carry out the conversion required extensive decontamination of the plant. Initial decommissioning work is in progress in the Dounreay Fast Reactor (DFR) which was shut down on completion of its programme some 18 months ago. The current status is that the nuclear fuel elements have been removed and transferred to storage; the primary liquid metal coolant has not yet been removed from the reactor but the less radioactive secondary liquid metal coolant has been transferred to dump tanks. The next major task will be disposal of the coolant and equipment for this purpose is being designed.

[1] Document 576/77, para 8, OJ No. C 85 of 10.4.1978, p.46

In addition, small scale experiments are being carried out to determine the most effective way of removing the radioactive contamination of the primary coolant before its disposal. The highly irradiated components from within the core which have been removed are the stainless steel support stool and spacers which received a high neutron dose from the adjacent fuel elements. A programme for the removal and examination of other core structure components has been proposed and is in the process of being evaluated. Other decommissioning work within the U.K. Atomic Energy Authority is focussed on the Windscale Advanced Gas-cooled Reactor, which is still operating but is expected to be shut down in the early 1980s. Following technical evaluation and feasibility studies, a planning team has been established to examine the facets of decommissioning this reactor to Stage 3 ('green field' state) and to prepare a detailed dismantling plan. This work will extend over the next 1½ - 2 years.

16. As a result of conversations with experts, and visits to sites in which decommissioning has already taken place, your rapporteur is of the opinion that there is no urgent need to demolish nuclear power stations that have been withdrawn from service. Such stations can be closed to the public and permitted to lose most of their radiation over a period of some 30 years. After this period the level of radioactivity, especially of Cobalt 60, would be very considerably reduced, thereby rendering the dismantling process much less expensive. The isolation of reactors that have been withdrawn from service is greatly facilitated by their siting in nuclear parks with several reactors inside the same perimeter fence. Thus there would be no need for additional physical protection measures, and costs would be reduced correspondingly.

17. Experts have also suggested recently that reactors might be designed and built so that only the core need be replaced when decommissioned, the outer shell, biological shield etc continuing in service over a very long period of time. One of the problems of total dismantling is that reactor parts with only a low level of radioactivity can be troublesome to dispose of because of their volume. The Commission ought to initiate research in this field.

IV. CONCLUSIONS

18. In Article 2 of the proposal for a Council decision the Commission stated that the expenditure commitments necessary for the programme were estimated at 6.38m EUA, with a staff of five. In the financial record sheet attached to the draft proposal the Commission gave the following break-down of the staff requested: 2 Grade A officials, 2 Grade B officials and 1 Grade C official. **As the research work would be carried out by other bodies under contract, the number of staff might be considered excessive. The Commission is requested in particular to reconsider its request for 2 Grade B officials.**

19. Article 2 of the proposal for a Council Decision is, in its present form, unacceptable to the European Parliament. This was made clear in the opinion of the Committee on Budgets. The European Parliament takes the view that appropriations for programmes must be decided in the context of the General Budget of the European Communities, with the Council and the European Parliament acting as the Budgetary Authority. The Committee on Energy and Research is accordingly proposing an amendment to Article 2, which would make it clear that the figures given in this Article are of an indicative nature only. At the same time this amendment will change the estimate of the number of staff required from 5 to 4, consequently reducing the expenditure commitments by the estimated cost of **one Grade B salary over five years.**

20. In conclusion the Committee on Energy and Research congratulates the Commission on its initiative in proposing these worthwhile studies, which should help to coordinate and develop the already considerable body of knowledge acquired in the Community on the decommissioning and dismantling of nuclear power plants.

OPINION OF THE COMMITTEE ON BUDGETS

Letter from the chairman of the committee to Mrs H. WALZ, chairman of the Committee on Energy and Research

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Luxembourg, 26 September 1978

Subject: Proposal for a decision adopting a programme concerning the decommissioning of nuclear power plants (Doc. 126/78)

Dear Madam Chairman,

At its meeting of 20 and 21 September 1978, the Committee on Budgets considered the above proposal for a Council decision. It was able to deliver a favourable opinion, but feels bound to point out that although this is a proposal for the adoption of a programme, the financial component, as well as the proposals concerning the staff necessary to achieve the objectives outlined, cannot be other than indicative, since the power to take decisions on financial and staffing commitments rests with the budgetary authority - the Council and Parliament - in accordance with the annual procedure for the adoption of the budget of the Communities.

Yours sincerely,

(sgd) Erwin LANGE

Present: Mr Lange, chairman; Mr Aigner, vice-chairman; Mr Alber, Lord Bessborough, Mr Dalyell, Mr Müller, Mr Nielsen (deputizing for Mr Caillavet), Mr Notenboom, Mr Schreiber, Mr Shaw, Mr Spinelli and Mr Würtz.

OPINION OF THE COMMITTEE ON THE ENVIRONMENT, PUBLIC HEALTH AND CONSUMER PROTECTION

Draftsman: Mr L. NOE'

On 22 May 1978, the Committee on the Environment, Public Health and Consumer Protection appointed Mr NOE' draftsman.

An initial exchange of views was held at its meeting of 26 September 1978.

The committee considered the draft opinion at its meeting of 22 November 1978 and adopted it unanimously.

Present: Mr Baas, vice-chairman; Mr Noè, draftsman; Mr Didier, Mr Granet, Lord Kennet, Mr Lamberts, Mr W. Müller, Mr Schyns, Mrs Squarcialupi, Mr Verhaegen, Mr Veronesi and Mr Wawrzik

1. Scale of the problem

The scale of the problem connected with the decommissioning of nuclear power plants is made quite clear in the Commission document:

- 20 nuclear power plants, though of small capacity, have already been taken out of service in the Western world; five of these are located in the European Community;
- 30 are due to be taken out of service by the year 2000 in the European Community;
- 50 are due to be taken out of service between 2000 and 2010/2015 in the European Community.

Although the dismantling of the plants can, if necessary, be delayed for long periods after they have been taken out of service, the scale of this problem is such that it justifies, and even demands, careful consideration.

Other international organizations such as UNIPEDE (International Union of Producers and Distributors of Electrical Energy) and the IAEA (International Atomic Energy Agency) have for a long time been studying the problems connected with the decommissioning of nuclear power plants. The IAEA has also published numerous recommendations and technical reports on this matter.

It would therefore seem desirable for the Community to participate and take an interest in the investigation, assessment and solution of these problems. It should, however, proceed in such a way as to avoid unnecessary duplication and, to this end, it should maintain close contacts with the other international organizations and coordinate work in this field. The advantages resulting from such coordination and cooperation are obvious.

2. Methods of decommissioning nuclear power plants

When a nuclear power plant is taken out of service, the nuclear fuel, radioactive materials in process and radioactive waste produced in normal operation are removed by routine operations. As regards the further procedure, that is, the actual decommissioning, three stages have been defined by the IAEA, namely:

Stage 1 decommissioning

The plant is practically kept intact. The mechanical opening systems (valves, plugs etc.) of the first contimination barrier are permanently blocked and sealed. The plant is under constant surveillance and inspections are carried out to check that it remains in good condition.

Stage 2 decommissioning

The primary circuit is reduced to minimum size and sealed, removing all parts which can be easily dismantled. The biological shield (e.g. concrete) is extended so that it completely surrounds the circuit.

After decontamination to acceptable levels, the containment can be removed. The other parts of the plant (buildings and equipment) can be dismantled or converted for new purposes. Surveillance around the barrier is necessary but can be relaxed as compared with Stage 1. External inspection of the sealed part should be carried out.

Stage 3 decommissioning

All remaining parts of the plant, whose activity remain significant despite decontamination procedures, are removed. The plant or site is then released without restrictions. No surveillance or inspection is necessary from the point of view of radiological protection.

Hence, the extent and nature of the work to be carried out depends on the 'stage' to be achieved after the plant has been taken out of service.

It would therefore seem desirable to establish, if only as a guide, the target decommissioning stage for nuclear power plants already built or yet to be built in the individual Member States.

This investigation could be of use in determining areas for study and research.

The current situation in the Community is that, of the 20 nuclear power plants in the Western world which have already been taken out of service, five are in Community countries and in most cases the decommissioning has not proceeded beyond Stage 1.

3. Actions proposed in the Community programme

The research and development actions provided for in the proposed Community programme concern the following subjects:

- Action No. 1 : Long term integrity of buildings and systems
- Action No. 2 : Decontamination for decommissioning purposes
- Action No. 3 : Dismantling techniques
- Action No. 4 : Treatment of specific waste materials: steel, concrete and graphite
- Action No. 5 : Large transport containers for radioactive waste produced in the dismantling of nuclear power plants
- Action No. 6 : Estimation of the quantities of radioactive wastes arising from decommissioning of nuclear power plants in the Community
- Action No. 7 : Influence of nuclear power plant design features on decommissioning.

Theoretical research can begin on Action No. 6 (estimation of the quantities of radioactive waste arising from decommissioning of nuclear power plants in the Community) and the results achieved could help to determine the priorities and the scale of the measures to be taken for the decommissioning of a nuclear power plant.

This action should be accorded top priority.

Likewise, with regard to Action No. 7 (influence of nuclear power plant design features on decommissioning), it should be borne in mind that measures could be taken in the short term which would undoubtedly be of use in the future; this action should also be given top priority.

The other proposed actions are no doubt useful, but they can be given a lower priority and use should be made for their implementation of all opportunities offered during the operation of the plants, such as the need to take large or highly radioactive components out of service; the need for complete decontamination; the transportation of particularly bulky components, etc.

The committee also considers extremely useful the proposal contained in the Commission document that the Community should participate in a large-scale operation, carried out in connection with the decommissioning of a nuclear power plant or of a major component and involving the demonstration of new techniques or the extension of proven techniques to a wider range of conditions, such as size and radiation level of components.

It is, however, to be hoped that this action will be defined more precisely and that detailed proposals will be submitted when the programme is under consideration.

4. Expenditure

The cost of implementing the programme amounts to 6.38 m EUA, to be divided between the seven actions mentioned above over a five-year period.

The committee hopes that the allocation of resources to the various countries will take account of their interests, experience and responsibilities in this field[1].

5. Conclusions

The Commission document provides a succinct summary giving a sufficiently comprehensive account of the individual problems involved in the decommissioning of nuclear power plants.

The committee considers the proposals put forward to be reasonable and acceptable, but suggests that an investigation should be carried out to establish the target decommissioning stages in the various Community countries. It hopes that it will soon be possible to define more accurately Community participation (with the participation of all the Member States concerned) in the decommissioning of a nuclear power plant or of components of particular interest; finally, the committee recommends that the proposed Community programme should be coordinated with that of other international (for example, the IAEA) and, possibly, national bodies in non-Community countries, to avoid unnecessary duplication and to make use of the knowledge and experience of others.

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[1] It is pointed out in particular that the three Italian nuclear power plants at Latina, Garigliano and Trino Vercellese have been in operation for more than fifteen years and that decommissioning could begin in about ten years' time. Some experience has been acquired with the decommissioning and cutting of the thermal shield of the pressurized water reactor at Trino Vercellese.

The committee also feels strongly that existing sites of nuclear installations should, where possible, be brought back into use, since this would be less damaging to the environment than the construction and contamination of new sites.