

COMMISSION OF THE EUROPEAN COMMUNITIES

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HILLMAN

PROPOSAL FOR A COUNCIL DECISION ADOPTING A RESEARCH
AND TRAINING PROGRAMME FOR THE
EUROPEAN ATOMIC ENERGY COMMUNITY ON FAST BREEDER REACTORS
(SAFETY - CODES AND STANDARDS)

(submitted to the Council by the Commission)

COM(75) 524 final.

INTRODUCTION

During the mid-60's the initial development on LMFBR's (liquid metal fast breeder reactors) in the Community of the Six was largely carried out under association agreements between EURATOM and the research establishments of the member countries. In the wake of this direct association, the Council of Ministers set up the Coordinating Committee on Fast Reactors (CCFR) in April 1970. Its items of reference were "to examine and to put into effect as broad a coordination and cooperation as possible between the different programmes, using the most appropriate procedures, and to formulate any useful suggestions to that effect".

The FRCC has continued its work within these terms of reference for the past four years. It has carried on regular examination of the entire range of problems and initiated the UNIPEDE study on "Long-term development prospects for fast breeder reactors in the Community of the Nine". A number of further complementary studies on this subject are at present under way. It has called upon two Working Parties - one on Safety, set up in 1971, and the other on Codes and Standards, set up in 1974 - to pursue these particular subjects further. At the same time, bilateral and multilateral contracts and agreements at all levels have helped to change and improve European cooperation on fast reactors.

Broadly speaking, the present system of collaboration on the various programmes may be considered as adequate up to the prototype stage, i.e. including the exchange of information on the construction and operation of prototype and other existing major facilities.

The problem of commercial introduction of fast reactors including the Demonstration Plant phase are extremely complex, related as they are to the industrial operation and development of other reactor types and to fuel strategy. While it is clear that the largest possible degree of concertation will be required in order to ensure success and to minimize the risks, the problems are not amenable to quick solutions, given both the development pattern of fast reactors in the member countries and the

fact that marketing at Community level is still far in the future. It may generally be concluded that the numerous initiatives of recent years at the level of government, industry and public utilities have been in the right direction.

The main functions of the Commission and of the FRCC will be continually to improve exchanges of information to stimulate discussion and to prepare the ground for joint projects wherever necessary. The most important subjects are safety research and general software development, the fuel cycle (especially reprocessing) strategic considerations connected with the marketing of fast reactors (which are currently being studied by UNIPED), advanced fuels development and strategy, and perhaps the question of adequate insurance or back-up for the liquid metal cooling system (i.e. possible development of an alternative fast reactor concept).

Safety research and general software development are now the main subjects which merit, and indeed demand, more Community action. A direct action programme in these fields is in fact under way at the Ispra JRC to supplement national programmes and the FRCC has concentrated its efforts in these fields through the Working Parties on Safety and on Codes and Standards. However, it is not enough to have set up these working parties and to have given them a remit; it will still be necessary to follow up and evaluate their work and to ensure that they obtain the necessary support to fulfil the tasks assigned to them.

For these reasons the FRCC, at its meeting on 12 June 1975, adopted an Advice (see Annex A) on the activities of the Safety and Codes and Standards Working Parties, in which it advocated strengthening their scientific and technical secretariat.

The Council itself, in its Resolution of 22nd July 1975, noted that the activities of the working parties in the field of nuclear safety could require the inscription in the budget of credits to finance an appropriate technical secretariat.

1. The Working Parties

1.1 Objectives

The terms of reference of the two working parties are given in Annexes B and C. Clearly the long-term objective of these working parties is to provide the software considered vital to ensure commercial introduction of the fast reactors on a Community basis, bearing in mind the following two requirements:

- development of a technically and economically viable concept;
- establishment of a competitive industry, operating in an open market.

To achieve this aim, it is essential to devise common, or at least compatible, safety criteria and engineering standards for the design, manufacture, inspection and operation of such plants. Naturally this will be a long-term process which will have to advance step by step, not only because of purely practical reasons but also because of the natural learning process involved and the general state of the art for this concept. It is for this reason that the initial phase of the work must concentrate on exchanges of information about on-going programmes, determination of the state of the art, the tackling of urgent specific problems, and in general, preparation of a sound technical foundation for the ensuing stages.

1.2 Working method

The working parties normally meet three to four times a year for one-day or two-day meetings. The first problem is the definition of the material which will provide the necessary input data for the working parties. This input has to be supplied by the national specialists and representatives working on specific projects. Then there is the compilation

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of inventories (R & D), libraries (codes) and other comparative listings (accident analysis) which have to be evaluated in order to identify differences, problems, and necessary additional work, likewise any changes to be effected in national attitudes which are incompatible with common objectives. State-of-the-art surveys submitted by specialists are used to probe areas where there is particular uncertainty, and where it is difficult at first sight to define the best way of handling the situation.

It should be noted that the SNG which has been in existence for longer than the Codes and Standards Working Party has subcontracted part of its work to two expert study groups, one on Whole Core Accidents, and the other on Containment Loading and Response.

1.3 Support required

The principal advantage of the groups mentioned above, as with all groups of this type, is that they bring together a vast body of experience and know-how which can be used to analyse information and input and output before (in preparation for) and after meetings. Their efficiency is, therefore, in direct relation to the quality or quantity of support made available to them.

The type of support required can be defined as follows:

- the generation or compilation of information extracted from national programmes, in a form suitable for the groups' purposes;
- the evaluation of this documentation in the light of the groups' objectives and terms of reference, and the formulation of conclusions and necessary recommendations;
- the study of specific problems and presentation of critical studies on the state of the art;
- the drafting of criteria, codes and standards.

While it is clear that the bulk of the information will have to come from the national programmes, the experts unanimously agree that this

kind of support will, in the first place, have to come from the scientific secretariat provided by the Commission. This is all the more true in the present situation, for oil crisis in particular has brought increasing pressure on national organizations to carry out their programmes on very tight work schedules and the need for such programmes to make increased use of cooperation and harmonization at Community level has become increasingly apparent. The Commission therefore proposes to make available to the working parties concerned a scientific and technical secretariat able to fulfil these tasks satisfactorily. This may even help to reduce the number of experts' meetings prior to the full working party meetings.

At the same time the Commission will ensure in connection with the competent Advisory Committee that the JRC research programme on reactor **safety takes**, as far as possible, into account the needs identified by the working parties.

2. Programme proposal

For the various reasons and motives outlined above it is proposed to carry out support activities for the "Safety" and "Codes and Standards" Working Parties on Fast Breeder Reactors under an action programme to be carried out at headquarters and to be entirely financed by the Community.

The project is expected to run until the commercial maturity of fast reactors in the Community is reached, i.e., for at least 5-10 years. It is therefore proposed that the project run over a five-year period (1976-80), subject to further extension.

The only costs for the project will be expenditure for 5 scientific and technical staff, namely 3 A's, 1 B and 1 C's, and administrative expenditure.

The means to be provided are:

Staff	5
Staff expenditure	1,120,000 U.A.
Administrative expenditure	410,000 U.A.

The Commission shall undertake to find the five officials necessary to the execution of the programme in respecting the existing staff roster; the Commission shall therefore not ask for the creation of supplementary posts.

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(Nuclear project to be carried out at Headquarters)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

HAVING REGARD TO the Treaty establishing the European Atomic Energy Community, and in particular Article 7 thereof;

HAVING REGARD TO the proposal from the Commission submitted after consultation with the Scientific and Technical Committee;

WHEREAS, in the actual state of development of fast breeder reactors, it is important to intensify the action, at Community level, for the coordination of the national programmes which has been going on in this matter for several years, especially, concerning the aspects connected with safety and the establishment of codes and standards for the construction and operation of the reactors mentioned;

WHEREAS the Coordinating Committee on Fast Reactors by its advice of 12 June 1975 invited the institutions of the Community and the national organizations to take any useful initiative to this effect and to cooperate in their implementation;

WHEREAS the Council by its resolution of 22 July 1975 agreed to an increased effort on the technological problems of nuclear safety at Community level;

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WHEREAS a research programme at Community level constitutes, at a first stage, an appropriate means to implement these principles;

HAS DECIDED AS FOLLOWS :

Article 1

A research and training programme on fast breeder reactors (Safety - Codes and Standards) as set out in Annexes I and II, is hereby adopted for a period of five years from 1 January 1976. The Annexes form an integral part of this Decision.

Article 2

The maximum commitments in respect of expenditure and staff to carry out this programme shall be respectively 1,53 million units of account and five staff, the unit of account being defined in Article 10 of the Financial Regulation of 25 April 1973 applying to the General Budget of the European Communities.

Done at Brussels,
For the Council,

The President

ANNEX I
NUCLEAR PROJECT TO BE CARRIED OUT AT
HEADQUARTERS

Scientific and technical support
for activities to be carried out by the
working parties on
Fast Reactor Safety and Fast Reactor Codes and Standards

A maximum amount of 1.53 million U.A. shall be allocated to this programme, for which the staff provision shall be 5 in number.

The programme shall provide the following type of support:

- the generation or compilation of information extracted from national programmes, in a form suitable for the working groups' purposes;
- the evaluation of this documentation in the light of the working groups' objectives and terms of reference, and the formulation of conclusions and necessary recommendations;
- the study of specific problems and presentation of critical studies on the state of the art;
- the drafting of criteria, codes and standards.

The programme will provide the necessary support for projects aimed at providing the software considered vital to ensure commercial introduction of fast reactors on a Community basis.

ANNEX II
TABLE OF MAXIMUM EXPENDITURE AND STAFF

Programme	Commitments (million U.A.)	Staff
Fast Breeder Reactors (Safety - Codes and Standards)	1.53	5



ANNEX A

A D V I C E

of the Fast Reactor Coordinating Committee
delivered at the meeting of June 12th, 1975

1. During the last four years, the Fast Reactor Coordinating Committee has pursued its work within its terms of reference. It has regularly examined the entire range of problems and initiated the UNIPEDD study on "Prospects of the Long Term Development of Fast Breeder Reactors in the Community of the Nine", for which a certain number of complementary studies are under way. The Fast Reactor Coordinating Committee has, in particular called upon Working Groups - one on Safety, created in 1971, and the other on Codes and Standards, created in 1974 - to pursue the study of these specific subjects further.
2. The Safety Working Group has dealt in depth with a number of subjects specified in its terms of reference. The Codes and Standards Working Group has made an initial survey of the problems and has drawn up a working plan for dealing with them.
Open exchanges of views have enabled an effective improvement to be achieved in reciprocal information on the different activities carried out in the Member States, as well as increased collaboration and more profound understanding of certain aspects of fast reactors.
3. With regard to their future activities the Working Groups have defined a certain number of tasks of priority interest (e.g. development of a common code for the analysis of serious accidents, a detailed study of fault trees, a comparison of the codes and standards applied to fast reactor projects under construction, elaboration of a common technical guide).

ANNEX A

4. In the light of the work proposed by the Working Group, the Commission has placed before the Fast Reactor Coordinating Committee a document indicating the possible ways in which it could contribute.
5. At its meeting on June 12th, 1975, the Fast Reactor Coordinating Committee studied the suggestions made by its Working Groups and also the document from the Commission.

The Fast Reactor Coordinating Committee is satisfied with the work carried out within the framework of the Working Groups, marks its agreement with the proposed tasks and priorities, and emphasizes its interest in the continuation of their activity.

The Fast Reactor Coordinating Committee:

requests the national organisations

- to contribute as effectively as possible to the accomplishment of the tasks proposed;

calls upon the Commission of the European Communities

- to take into account the requirements identified by the Working Groups, when drawing up the programme propositions for the JRC;
- to undertake in a first step, any initiative which could increase its support to the work of the groups by strengthening their scientific - and technical secretariat;
- to examine in a next step the usefulness of proposing any further action - about which the Fast Reactor Coordinating Committee will be consulted in due time - which is likely to increase the community effort in the field of safety and codes and standards for fast reactors.

Terms of reference
for a Working Party on Codes and Standards

In the field of industrial-scale application, the Working Party on Codes and Standards for Fast Reactors set up by the Coordinating Committee on Fast Reactors is to:

- draw up a list of the construction codes, standards and regulations in force in the Member States with regard to component design criteria and the choice of structural materials, their use and their control for operating conditions in sodium cooled fast reactors;
- define the points of similarity and analyse the problems relating to points of dissimilarity.

The Working Party will also define the fields in which additional theoretical or experimental data are required.

The Working Party will inform the Coordinating Committee on Fast Reactors of its working plan as soon as possible, together with the order of priorities to be applied as its work progresses.

ANNEX C

Terms of reference
for the Working Party on Safety of the Fast
Reactor Coordinating Committee as drawn up at the
meeting held in Brussels on 9 December 71

The Working Party on "Safety" set up by the Fast Reactor Coordinating Committee shall draw up a list of work undertaken or planned under the various programmes. It shall help to improve the exchanges of know-how in fast reactor safety in order to facilitate coordination of the programmes, in due awareness of the desirability of making preparations for harmonization of safety criteria within the Community to be put into effect at a later date according to appropriate procedures. It shall also be able to propose new studies at the technical level which could be used to back up existing programmes.

The Working Party shall deal with the following:

- Identification and study of phenomena involved in the initiation and evolution of accidents which could damage the reactor and lead to a safety problem for the staff and environment;
- Methods for accident analysis and safety evaluation;
- Evaluation of the efficiency and reliability of both the systems and the equipment provided for the prevention of accidents;
- Furtherance of knowledge on the sources and magnitude of energy and radioactivity released under normal and accident conditions, in order to facilitate the design and analysis of safety systems;
- Evaluation of the efficiency and reliability of the safety systems and limitation of accident consequences.

FINANCIAL RECORD SHEET

Budget entry: Chapter 3.67 "Fast Reactors" in the Statement of expenditures relating to research and investment activities (Annex I to Section III "Commission" of the Budget of the European Communities)

Legal basis : Article 7 of the EABC Treaty
Proposal forwarded to the Commission on _____

Authorising department : Directorate General for Industrial and Technological Affairs

Description, aims and grounds for the project:

Support activities for the Safety and Codes and Standards working groups of the Coordinating Committee on Fast Reactors.

These include:

- 1) preparation and compilation of information derived from national programmes,
- 2) evaluation of this data,
- 3) study of specific problems,
- 4) establishment of draft criteria, codes and standards.

The aim of the programme is to provide a technical secretariat for the working groups responsible for promoting the commercial introduction of a Community network of fast reactors, having regard to the need to develop a competitive industry in an open market.

Duration of project: 1.I.76 - 31.XII.80 (5 years)

Staff : 3 category "A"
1 category "B"
1 category "C"
5 Community servants

Cost of project : 1,530,000 UA (staff expenditure and administrative expenditure)

Timetable of commitments and payments:

1976	225,000 UA
1977	260,000 UA
1978	300,000 UA
1979	345,000 UA
1980	400,000 UA

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Financing of project:

Entered in Chapter 9.33 of the 1976 budget.

Type of control to be applied:

Scientific and technical control will be carried out by the Coordinating Committee on Fast Reactors.

Financial control will be carried out in accordance with the procedures laid down by the Financial Regulation applicable to research appropriations.