

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(87) 491 final /2

REVISED VERSION

Brussels, 20 April 1988

THIS DOCUMENT CANCELS
AND REPLACES DOCUMENT
COM(87) 491 final

CONCERNS ALL THE
LANGUAGES

A NEW OUTLOOK FOR THE JOINT RESEARCH CENTRE

"Nous n'avons jamais à choisir
entre la stabilité et l'aventure,
entre la résignation et la
révolte, mais seulement entre
les risques du passé et ceux de
l'avenir "

Jacques SPAEY

(Communication from the Commission)

CONTENTS

	<u>Page</u>
SUMMARY A NEW JOINT RESEARCH CENTRE	2
COMMISSION PROPOSAL	
1. INTRODUCTION	6
2. A NEW ROLE FOR THE JRC	7
2.1 The remit of the JRC	7
2.2 The functions of the JRC	9
2.3 Main lines of the JRC's future activities	9
2.4 JRC activities beyond 1991	21
3. A NEW MANAGEMENT FOR THE JRC	23
3.1 The general framework	23
3.2 The internal structure of the JRC	23
3.3 The decision-making and consultative structure	29
3.4 A new personnel policy for the JRC	31
4. EVOLUTION OF JRC RESOURCES	33
4.1 Trends in overall resources	33
4.2 Specific programmes	37
4.3 Budgetary implications	39
5. PROPOSALS FOR COUNCIL DECISIONS	41
6. CONCLUSION	51
Annex I Scientific and technical orientations of the specific programmes and support activities of the JRC	
Annex II Evaluation of research results	

SUMMARY

A NEW JOINT RESEARCH CENTRE

1. The implementation of the Single European Act, the approval of a new Framework Programme and the renewal of the present JRC multiannual programme provide a unique opportunity to reform the Centre in depth. The Commission is fully conscious of this and intends to meet this challenge. Its formal proposal to the Council is aimed at that objective.

It will mean a major revitalisation of the JRC to bring it into step with the development of the Community and to give it a new impetus to assure it of an uncontested place within the European research and development system.

This reform will bring important changes which will require a sustained effort for their accomplishment, although a determined start will be made on the implementation of these changes during the next four year period, they cannot be all implemented at a stroke, and will extend over the next eight to ten years.

2. The institutional situation of the JRC, its objectives and priorities

The Commission considers that the new JRC must remain solidly anchored within the Community system, it is an integral part of European R&D strategy and in this capacity must maintain its institutional rôle of scientific and technical support for the implementation of Community policies, while at the same time becoming more open to the outside.

Community policies guide the JRC in the orientation of its research activities and in defining its priorities, these are primarily the establishment of the Internal Market and its corollary, the improvement of industrial competitiveness, but also the protection of the environment and improvement of safety, as well as other policies such as agriculture.

While the Commission must remain the main client for JRC work - which does not imply an exclusive recourse to the JRC in the assignment of Community tasks - it is clear nevertheless that the JRC must start to look for other clients, to accomplish this, it will be encouraged to place its specialised neutral and independent scientific potential at the disposal of national organisations or industries in the Member States by means of research contracts, service work, cooperative projects, industrial clubs and so on.

Preparatory research will be developed, moreover, in order to promote the pursuit of scientific excellence in a world of continuous scientific and technical change, this scientific excellence must be an essential feature of all that the JRC undertakes.

Whatever the nature of the work undertaken, it must be compatible with the major objectives of the Community, there is no question of transforming the JRC into an organisation outside the Community framework

3 Financing

In order to take this evolution into account, the financial resources of the JRC will be only partially derived from the execution of specific research programmes, i.e. appropriations under the Framework Programme. The rest of the JRC's financial resources will be derived essentially either from providing scientific and technical support for clients inside the Commission or through contracts placed with Member States, national organisations or the private sector. It is estimated that, by the time the next multiannual programme is completed at the end of 1991, the proportion of the JRC's income relating to the Framework Programme will be down to 60% and is unlikely to exceed 50% by the year 2000.

4. Operation of the JRC

The most immediate and far-reaching changes will be made in the operation and management of the Joint Research Centre. These changes make a clean break with the practices of the past

The aim of these reforms is to give the JRC as a whole greater autonomy and more management flexibility

The Commission will, in the future, establish a clearer distinction between programme management and resource management. For the latter, the greatest possible autonomy will be given to operational scientific units which will have full scientific, administrative and financial responsibility for the implementation of their tasks.

The allocation of responsibility to the scientific units will lead to a better utilisation of human resources, the encouragement of innovation and a permanent quest for excellence; these are the guarantees of tomorrow's success.

With this in mind, the JRC will be reorganised on the basis of nine scientific institutes: a new institute initially at Ispra, one for each of the three Establishments at Geel, Karlsruhe and Petten, and five for the Ispra Establishment where, amongst other things, the matrix structure of projects/disciplinary departments will be abolished

This structure is intended to give the scientific units a sharper identity and a clearer vocation, moreover, it is the natural mechanism to wind up redundant activities or those that have reached maturity.

In addition, this change of internal structure will be accompanied by a significant reform of the present consultative structure, characterised by the following essential points

- the reinforcement of the powers of the JRC Board of Governors,
- the abolition of the Scientific Council for the JRC as a whole,
- the streamlining of specialised consultative structures which will be limited to one committee per Scientific Institute.

5. Personnel

To launch the new JRC, the Commission intends to maintain the volume of JRC activities at the present level

The redefinition of Community research aims has to be accompanied by a recasting of staff policy.

Three essential criteria should be satisfied

- the relevance of the qualifications at the start of the programmes,
- the flexibility of qualifications and resources in response to changing needs,
- the links between the Community effort and national effort in the field of personnel policy

It is on that basis that costs can be controlled and productivity improved.

In the present circumstances and in the light of the above criteria, the Commission must continue its policy of recruiting scientific and technical staff on a temporary basis only. However, the Commission intends to adopt a series of new measures to satisfy the criteria mentioned above and so provide the framework in which the scientific and technical objectives can be attained.

The following new measures are planned

- increased flexibility in the allocation of staff resources to scientific tasks, within clearly determined ceilings,
- the management of temporary contracts to guarantee a significant rate of non-renewal,
- a system of fixed duration secondments both from JRC towards industry and national centres and vice versa,
- an increase in the number of fellows and scientists visiting the JRC,
- special arrangements for termination of service directly related to the matching of qualifications to the new objectives,
- new methods of cost control to reduce overheads

This set of measures should have as its first objective the maintenance of scientific and technical quality whilst assuring staff motivation.

6. Conclusion

The Commission considers that the far-reaching modifications envisaged at all levels are indispensable to ensure a stable future for the JRC; that is the tenor of this proposal. All of the Community Institutions will have to take their share of the responsibility for a decision which must lead to a new JRC, endowed with an uncontested mission and permanently facing up to the challenge of the evolution of science and technology

1. INTRODUCTION

The aim of the Commission proposal is to provide a lasting solution to the problems which have beset the JRC and affected its operation in the past and which have created an obstacle to the full and total acceptance of its rôle in Community research under the Single European Act and the Framework Programme. This solution consists in introducing a sweeping reform of the JRC's objectives, its mode of operation and its methods of management.

The programme of JRC activities for 1988-91, which is the subject of this proposal, is designed to allow a resolute start to be made on this reform process. It will take more than four years to attain these objectives, however determined and conscientious the effort. Consequently, this document places the 1988-91 programme proposal in a longer-term perspective of 8 to 10 years, both in terms of its scientific and technical orientations and of the range of JRC activities.

The report requested by the Commission from the Panel of Senior Industrialists puts forward important recommendations for the formulation of this proposal, the report prepared for Mr. L. Granelli, then Minister of Research, by a special advisory committee of Italian experts, the resolution adopted by the European Parliament on 12 December 1986 on the revision of the 1984-87 JRC Programme for 1987, the opinion of the Economic and Social Committee of 27 November 1986 concerning that revision, the comments of the JRC Board of Governors on the Panel of Senior Industrialists' report and the contributions of several Member States, as well as the debate in the Council on 28 September 1987, have all provided the Commission with material for consideration.

This document presents a general overview of the proposed reforms and the proposals for the decisions to be taken by the Council in line with the established procedures. The adoption of certain measures falls within the sole competence of the Commission, which will take the necessary decisions to that end.

2. A NEW ROLE FOR THE JRC

2.1 THE REMIT OF THE JRC

What rôle should be assigned to the JRC in response both to changes in the research and development function and its place in Europe's socio-economic context, and to criticisms that its activities are not sufficiently geared to the Community's real needs?

The Commission considers that the JRC must remain firmly anchored within the Community system, it is an integral part of European R&D strategy and in this capacity must maintain its institutional rôle of providing scientific and technical support for the implementation of Community policies, while opening up more to the outside

Community policies guide the JRC in the orientation of its research activities and in defining its priorities; these are primarily the establishment of the Internal Market and its corollary, the improvement of industrial competitiveness, but also the protection of the environment and improvement of safety, as well as other policies such as agriculture.

While the Commission must remain the main client for JRC work - which does not necessarily mean exclusive recourse to the JRC for the assignment of Community tasks - it is clear nevertheless that from now on the JRC will have to look for other clients, to accomplish this, it will be encouraged to place its specialised neutral and independent scientific potential at the disposal of Member States' national organisations or industries by means of research contracts, service work, cooperative projects, industrial clubs and so on.

Preparatory research will also be developed to promote the pursuit of scientific excellence in a scientific and technical context that is constantly changing, this scientific excellence must be an essential condition for all JRC work

Whatever the nature of the work undertaken, it must be compatible with the major objectives of the Community, there is no question of transforming the JRC into an organisation situated outside the Community framework.

How can one identify the areas where a JRC contribution has an advantage over other forms of action. The following criteria can serve as a guide in this respect and are particularly relevant to the JRC :

- Performing research in which the specifically Community nature of the Centre is an advantage either because of its independence of judgement and neutrality or because of the close links with the Commission's Directorates-General responsible for implementing Community policies. This applies primarily to research of a regulatory or prenormative nature or of public utility, and it is here that the institutional rôle of the JRC appears most clearly.

- Performing research of the scientific watch type where there is an advantage in concentrating at a central point in the Community specialised research with a long-term interest or a high risk element. Scientific excellence is an essential condition to justify the concentration of research at the JRC. The actinide research at the Karlsruhe Establishment is a good example of this type of work.
- Serving as a focal point for research on cross-frontier problems in which the JRC, through integrated operations bringing together its own research and the work of industrial or national laboratories, acts as a driving force of the European effort, with the enlargement of the Community, in particular, it can provide links and establish cooperative relations with centres in Member States that are less highly developed scientifically, thereby strengthening intra-Community ties. For the more developed countries, the Community structures in general and the JRC in particular can usefully serve as a link to the other Member States, in particular to facilitate the acceptance of one technological solution or another.
- Providing specialised training through research. It is not a question of replacing universities, but of strengthening ties with them, offering them the specialised training facilities they do not possess within their own structures.
- Finally, through programmes carried out in association or through specific work under contract, providing industry and public bodies in the Member States with specific expertise developed in the course of research and with highly specialised and costly installations, duplication of which elsewhere in the Community is not justified.

On the basis of this set of criteria for the selection of JRC activities within the wider set of criteria adopted in the Community's Framework Programme for Research and Technological Development for all activities organised by the Commission, it is possible to determine both the topics on which the JRC should concentrate in the future and the most appropriate forms of action. These are described in the following paragraphs. Broadly speaking, the implementation of these criteria will lead to a "twin-track" development of the JRC .

- strengthening its scientific and technical support rôle in the carrying out of Community policies,
- making its expertise more widely available to outside customers.

Before sketching these in broad outline, it is necessary to introduce the principle of the customer/ contractor relationship and its application in the specific case of the JRC.

Amongst its recommendations, the Panel of Senior Industrialists urged the application of this principle to the tasks of the JRC. The Commission considers that this will ensure that JRC research is geared to the real needs of the users and help the researcher to realise that his work should be directed towards precise objectives. However, it is important when applying this principle not to lose sight of the specific nature of the JRC as a Community instrument. Of course the

experience gained within the research establishments of the Member States is valuable and must be used, but it would be wrong simply to pattern the JRC on national models. The way in which the Commission plans to apply the customer/contractor principle will be made clear during the description of the various forms of action of the JRC.

2.2 THE FUNCTIONS OF THE JRC

It is proposed that the functions of the JRC fall into four main categories

- the execution of specific research programmes on a multiannual basis,
- scientific and technical work in support of the other Commission services,
- performing research or providing services under contract for third parties,
- non-specific preparatory research intended to open up new avenues for the JRC and to maintain a high level of scientific excellence

Until now the JRC has concentrated almost entirely on carrying out multiannual research programmes, work in support of the Commission departments has been no more than a limited spin-off, more because no staff were directly assigned to this work than through a lack of interest on the Commission's part. Services under contract for third parties have been the exception, apart from the operation of the HFR reactor as a supplementary Euratom programme on behalf of the German and Dutch governments. This was a deliberate policy designed to keep the JRC remote from the market and to transfer to others any activities liable to be of a commercial nature. Finally, there has been very little, if any, non-specific preparatory research up to now, and where it has existed it has developed within or in direct relation to a programme.

The change proposed by the Commission is therefore significant. Without jeopardising the institutional rôle of the JRC, it is designed to allow far more contact between the JRC and the outside world.

2.3 MAIN LINES OF THE JRC'S FUTURE ACTIVITIES

The main lines of the JRC's future activities are summarised below. They will be described in detail in the annual schedule of JRC activities which will be submitted to the JRC Board of Governors.

2.3.1 Specific JRC programmes

They will continue to account for a substantial proportion of the JRC's activities even though their share will decline over the period 1988-91 and beyond. Together with scientific and technical work in support of other Commission services (see point 2.3.2 below) they

constitute the most direct contribution to the implementation of Community policies. To ensure the success of this contribution, the programmes selected should satisfy the criteria set out at the beginning of this chapter, in particular independence of judgement, the neutrality of the JRC, the central character of certain cross-frontier or scientific watch-type research and the making available of specialised skills. It is on this basis, after both internal and external discussions, that the selection has been made within the broader scientific and technical objectives defined in the Framework Programme.

Specific research programmes will be concentrated on three major topics :

- contribution to the creation of a large internal market,
- the enhancement of safety, prevention and mitigation of accidents,
- the surveillance and protection of the environment.

The completion of a large internal market by 1992 will bring a significant increase in the demand for new standards, new codes of practice and new safety and quality control regulations. This is essential in order to ensure full accessibility of markets, to avoid distortions of competition and to protect consumers : it is also a significant factor in strengthening the competitiveness of European industry vis-à-vis its non-Community rivals.

The subject of improving safety and prevention and mitigation of accidents is increasingly exercising the minds of the general public and politicians : their concern has been aroused both by nuclear activities, since Chernobyl, and by other industrial activities, following the accidents at Seveso, Bophal and, more recently, Basle.

This subject has quite a significant influence on public acceptance of technological innovation and is therefore an important aspect of the development of industrial competitiveness.

The environmental monitoring and conservation activity similarly reflects an acknowledgement of public concern for a better quality of life in an environment which, unfortunately, is deteriorating.

Greater safety and a protected environment restored to its proper state will undoubtedly play a key part in securing public acceptance of new technologies.

*
* *

All of the specific research programmes proposed by the Commission are set out in Table 1, which indicates in each case the subject heading or headings under which it belongs and its relationship with the lines of action or sub-lines in the Framework Programme.

Annex I to this document gives a description of the scientific and technical content proposed for the specific programmes, its development over the period 1988-1991 and the expected developments over an eight to ten-year period; it seemed essential to bear in mind that the scientific and technological environment is changing at an ever-faster pace and consequently to take a dynamic view of the JRC programmes and incorporate them in an approach extending over at least two multiannual periods.

TABLE 1

SPECIFIC PROGRAMME	SUBJECT AREA	LINE OR SUB-LINE OF ACTION IN THE FRAMEWORK PROGRAMME
- Evaluation and monitoring of radioactivity	Safety, Environment	1. Quality of life 1.2 Radiation protection
- Environmental protection	Environment, Internal Market	1. Quality of life 1.3 Environment
- Application of remote sensing techniques	Environment	1. Quality of life 1.3 Environment
- Industrial Hazards	Safety, Environment, Internal Market	1. Quality of life 1.3 Environment
- Advanced materials	Internal Market, Safety	3. Modernisation of industrial sectors 3.2 Science and technology of advanced materials
- Nuclear measurements and reference materials	Internal Market	3. Modernisation of industrial sectors 3.4 Technical standards, measurement methods and reference materials
- Reference methods for the evaluation of structural reliability	Internal Market, Safety	3. Modernisation of industrial sectors 3.4 Technical standards, measurement methods and reference materials
- Reference methods for non-nuclear energies	Internal Market	3. Modernisation of industrial sectors 3.4 Technical standards, measurement methods and reference materials
- Reactor safety	Safety	5. Energy 5.1 Fission nuclear safety
- Radioactive Waste management	Safety, Environment	5. Energy 5.1 Fission nuclear safety
- Safeguards and fissile material management	Safety	5. Energy 5.1 Fission nuclear safety
- Nuclear fuels and actinides research	Safety	5. Energy 5.1 Fission nuclear safety
- Fusion technology and safety	Safety	5. Energy 5.2 Controlled thermonuclear fusion

The customer/contractor principle is applied to the specific programmes conducted by the JRC and Annex I discusses this application for each of them. Obviously it is in the specific programmes more than in any other of the JRC's tasks that the Community dimension has to be taken into account in implementing the customer/contractor principle, the final customer is none other than the Community as a whole, with the Commission acting as a proxy customer through the responsible Directorates-General. As the recent report by the House of Lords Select Committee on Science and Technology¹ pointed out, there is sometimes a problem because the customer service does not have the necessary expertise to define its research requirements precisely even though it perceives more clearly its requirements for implementation of the policy for which it is responsible. As emphasised in that report, the main thing is to ensure close relations between the groups carrying out the research and those benefiting from the results. The proposed reforms in the JRC's advisory structure (described in Chapter 3) are devised with this in mind. To sum them up, one may consider that the Euratom Scientific and Technical Committee (STC) for the nuclear part and CREST for other matters will have to keep an overall watch in future to ensure that themes are geared to the needs of the Community as customer; the Scientific Institutes' Advisory Committees, which will work in liaison with the Advisory Management and Coordinating Committees (CGCs), will be made responsible for this task at a more detailed level.

Overall, it is planned to reduce the specific programmes below their current level during the period 1988-91, their share of the total volume of JRC activities should fall from 87.2% (average for the period 1984-87) to 69.7% (average for the period 1988-91) and to under 50% in 1998. This corresponds to a drop from 78% in 1988 to 61.5% in 1991.

The reason for this trend is that certain research activities will come to an end during that period, a number of them will be continued either in the form of scientific and technical support for a particular Directorate-General of the Commission or in the form of research or services under contract with other third parties. Others may lead to pilot projects funded by other instruments with a view to the industrial application of the results obtained.

2.3.2 Scientific and technical support for the other Commission departments

Over and above the contribution which specific JRC programmes make to the formulation and implementation of Community policies, the expertise developed and installations set up can be made available to the Commission's Directorates-General for various scientific or technical services of benefit to them. This is a good illustration of the application of the customer/contractor principle.

¹ House of Lords - Session 1986-1987 - 1st report - Select Committee on Science and Technology - Civil Research and Development - (HL 20-1), page 36

A list of work already identified in this category is given in Table 2. A description of the contents is set out in Annex I, it illustrates the type of tasks that the JRC will have to carry out, but is far from being exhaustive. Discussions with potential customers are continuing and obviously some requirements will only emerge as time goes by.

Support for the Commission's services falls into two identifiable categories

- Operations having some continuity, generally carried out on a multiannual basis, for example, the remote sensing operations for the Directorate-General for Agriculture and the Statistical Office of the EC or the technical support for Euratom safeguards and that planned for the Directorate-General for the Environment can be placed in this category
- Work of a more ad-hoc nature meeting specific temporary requirements in the Directorates-General; this is defined on an annual basis by a users' committee representing the Commission services concerned

Support for the Commission departments which, like the specific programmes, is part of the institutional function of the JRC, will account for a growing share of its total turnover. From no more than 3% in 1987, it is expected to be as high as 9% in 1988 and to rise to 14% by the end of the 1988-91 period. This upward trend is likely to continue the large internal market scheduled for 1992 is not an end in itself, but rather the start of new Community developments requiring a significant scientific and technical input

All of the appropriations necessary for these activities will be entered under the sections of the budget specifically concerned with research

2.3.3 JRC services for third parties

The third category of JRC activities covers work performed with external financial resources, it is the type of activity where the customer/contractor principle is most clearly seen at work. Such external financing may be the result of

- a contract with a Member State or a group of Member States for the operation of a facility, or the execution of research activities which fall within the general scope of the JRC specific programmes via collaborative projects, participation in Eureka projects will come under this heading,

TABLE 2

JRC S/T SUPPORT FOR COMMISSION SERVICES

- S/T support for international cooperation
 - Nuclear Safeguards
 - Technical assistance and cooperation (under discussion)
- S/T support for the developing countries
 - Remote sensing (Fishery resources) in the coastal regions of NW Africa
 - Remote sensing in the Sahel
- S/T support for industrial policy
 - Development of a European reference method (Codes for the building industry)
- S/T support for social policy
 - Radiation protection
 - Safety at work
- S/T support for the Common Agricultural Policy
 - Integrated plant protection
 - Laboratory for foodstuffs analysis (wine)
 - Applications of remote sensing in agriculture
 - . Regional inventories
 - . Conditions of growth and crop yield indicators
 - . Models for yield forecasting
 - . Rapid estimation of acreages and potential yields in Europe
 - . Advanced agricultural information system
 - . Area frame sampling, associated surveys
 - . Long-term research
- S/T support for transport policy (p.m.)
- S/T support for environmental protection policy
 - Chemicals
 - Atmospheric pollution
 - Waste
 - Water quality
 - Major accidents
- S/T support for the Community Bureau of Reference
 - Non-nuclear reference materials
- S/T support for information technology and telecommunications policy (p.m.)
- S/T support for fisheries policy
 - Remote sensing for fishery resources (p.m.)
- S/T support for regional policy - Remote sensing for regional policy purposes (under discussion)

- S/T support for energy policy
 - Nuclear safeguards
 - Energy saving and alternative energy sources
- S/T support for the Customs Union (p.m.)
- General support
 - Support for cooperation and mutual assistance in the event of disasters
- S/T support for innovation policy
 - Technology transfer and utilisation of JRC research results

- the execution of research or service activities within the framework of an industrial club, for which the industrial partners would have to pay an entrance fee and annual dues,
- the performance of research under a specific contract;
- the performance of scientific or technical services for payment,

to which other tasks could be added, if the opportunity presents itself, such as :

- the execution of supplementary EEC programmes, with or without the participation of the Community,
- the execution by the JRC of work of Community interest co-financed by the Community and a Member State or a group of Member States or private industry. The LOBI project, carried out at the JRC originally at the request of the German government, is an example of how successful this type of work can be;
- and finally, the provision of scientific/technical and logistical support to major installations on the site of one of the JRC establishments.

Major efforts are being devoted to the finding of customers and contributions for JRC activities falling under this third category, which, until 1987, were considered outside the JRC's remit.

For the time being, specific work falling under the specific programmes, use of specialised JRC facilities and work under the industrial club formula appear to be the most promising.

A special effort will be made to perform work for small and medium-sized businesses, mostly on the basis of multi-client contracts. Industrial consultancies and the network set up by the SME Task Force will be used to provide the specialised marketing required.

Other work for third parties is envisaged as a spin-off from JRC expertise and from results acquired through the execution of specific research programmes.

The exploitation of the HFR reactor under the aegis of a supplementary Euratom programme falls into this category; it will be operated on behalf of the Dutch and German governments. The work will include irradiations for some specific JRC programmes as well as work for third parties who will be actively sought.

These activities will grow according to the external demand for such work, they are likely to account for as much as 14% of all JRC activities by the end of the 1988-91 period, and possibly twice that figure by the year 2000.

2.3.4 Preparatory research

The fourth category of JRC activities covers JRC preparatory research. The Commission welcomes the proposal of the Panel of Senior Industrialists that a share of the total turnover of the JRC should be dedicated to preparatory research. These funds will be allocated to increasing the level of excellence of each laboratory in selected scientific areas.

It is in the very nature of preparatory research that its scientific and technical objectives cannot be defined in detail from the outset. It evolves as a function of the discoveries made during the "exploration" of uncharted territory. Nevertheless the initial direction can of course be identified. That is why the guiding lines of this action which will provide the basis for selecting those subjects which are most appropriate for this preparatory research were discussed with the JRC Board of Governors. The arguments which would lead to the selection of a particular action are :

- The improvement of scientific vitality and potential

The intention here is to enable specialised groups to keep abreast of developments in their field and to gauge the capacity to carry out a programme or other tasks. There could even be circumstances where it might be necessary for the JRC to acquire new expertise in parallel to that which it already possesses.

- The exploration of suitable and promising avenues

Opportunities often arise to pursue lines of action at a tangent to the main programme which do not contribute directly to the achievement of the programme objectives. Nevertheless, exploration of these particular avenues can be of benefit to the overall programme and throw up new research ideas. Even if research over the last few decades has been increasingly "by objectives", the concept of serendipity cannot be rejected altogether.

- The testing of new ideas or concepts on a small experimental scale

Most actions require small beginnings to build up confidence in an idea, relate it to the general background and to appreciate its originality and potential. In such cases a fair amount of stop/go must be tolerated and even the possibility of rejection. Since new ideas are often sketchy at the start, this "airing" is often a useful way of firming up ideas and making the action plausible.

- The provision of additional facilities for visiting scientists and fellows

The aim here is to strengthen the scientific vitality of the JRC through short visits by scientists, particularly young scientists, of high calibre who wish to enjoy freedom in their scientific work.

Given that most visitors in these categories are attracted to the JRC by the facilities and collaborative opportunities it offers, they should be allowed to develop them in directions deriving from their different experience in their home institutes. In this way they will help to build up the JRC in the areas of most relevance to the current research interests in the Member States. It will also improve the continuity of the contacts and consolidate collaborative actions. In this way it would be possible to promote the introduction of fresh ideas from outside the JRC and make visiting periods more productive.

- The enhancement of the impact of industrial club activities

Where interaction with an industrial club is involved, increased resource allocation can have a marked multiplier effect which would provide for an appropriate competitive response beyond the strict requirements of outside customers.

Proposals for preparatory research must, within the guidelines set out above, come essentially from research groups and from those responsible for scientific activities in the JRC. This process will be reinforced by the scientific opinions that the Advisory Committees of the Scientific Institutes will be called upon to give concerning the work of their respective Institutes. Together these proposals will be analysed and a selection made by the Director General, who will include the preparatory research themes for a particular year in the work schedule for that year, submitted to the JRC Board of Governors for approval. If it were felt necessary, independent experts could be asked for an opinion.

The follow-up of this type of research will be similar to that of other types of research, preparatory research will be included in the annual report produced in liaison with the Board of Governors

The chief consideration with this type of research is to maintain a bottom-up approach, although this in no way means that the subsequent rigorous checks on its execution can be avoided. Preparatory research offers the JRC a chance of scientific revitalisation which it would be wise to exploit.

The idea is to introduce these new types of activity gradually, it is planned to launch them in 1988 and develop them to the stage where they account for 7.6% of the total JRC resources on average over the period 1988-91.

*
* *

2.3.5 Two new lines of development for the JRC

2.3.5.1 The Triangle information technology, telecommunications, electronics

Increasingly, all of the research activities described above are necessitating the use of information technologies (advanced computing, knowledge processing, expert systems, man-machine interaction, data banks etc.), telecommunications (e.g. ultra-high-speed data transfer) and electronics (advanced instrumentation), the JRC's basic skills in these fields have to be maintained and further developed to enable it to carry out this research in a modern and efficient way.

The activities in the field of information technology will take various forms

- a) support for specific programmes;
- b) support for the work of other Commission services, it will be necessary here to see what support can be given to the Directorate-General for Telecommunications, Information Industry and Innovation,
- c) contract work for third parties and participation in Eureka projects,
- d) preparatory research

In the telecommunications field, and especially telecommunications standards, attention will be focused on how the JRC can contribute to the implementation of the Green Paper on the development of the common market for telecommunications services and equipment which is due to be examined

Lastly, as regards electronics, apart from helping in the execution of specific programmes, the main line of research development from now on will be on the development of instrumentation in conjunction with outside clients (e.g. the use of ultrasonic techniques in medicine).

The activities will be combined within a single scientific unit.

2.3 5.2 The JRC as a centre for prospective technology studies : promoting the competitiveness of industry.

Prospective studies and technology assessment are part of the work necessary for the smooth running of a multi-disciplinary research centre, enabling it to identify new avenues and new directions for its own activities. Apart from being necessary internally, this capability can also be used to cater for external requirements. The Commission feels that it is time to speed up and widen the scope of this research, particularly with a view to improving industrial competitiveness

Since 1984 there have been a number of important developments - the adoption of a series of Community research programmes geared to new technologies (e.g. ESPRIT, BRITE, EURAM, Non-nuclear energy, RACE), the launching of EUREKA in 1985, the signing of the Single Act in 1986 and the approval of the Framework Programme in 1987 - which have signalled a new phase in the common research and technological development (RTD) policy which is supposed to culminate in the creation of a genuine European Technology Community. As a result, prospecting, assessment, scientific watch and strategic analysis will assume a new significance in the context of scientific and technological developments. This work will become an integral and essential part of the process of programming Community research. In particular, the scientific and technological watch function, which is virtually unknown in the Community, will be called upon to play a key role in the future alongside the prospective studies and technology assessment functions.

That is why the Commission felt it necessary to adjust the functions and methods of the FAST programme. Similarly there is a need to ensure closer coordination between prospective studies and strategic analysis carried out by an increasing number of Directorates-General in their own fields (including DG III, DG V, DG VI, DG XII, DG XIII and DG XVII, ...). More especially the Commission believes that it would be advisable for the JRC to allocate a part of its resources for regular and systematic strategic analysis and scientific and technological developments for the purpose of improving the competitiveness of European industry.

Situated as it is in a direct line with the objectives assigned to RTD by the Single Act, the special feature of the JRC's role in this area is its ability to supply strategic analyses based on "inside knowledge" of the scientific and technical trends in the world of research.

In addition to in-house studies concerning the JRC's own future, this involves strategic studies of technological development (including technology assessment studies) carried out at the request of the Commission, the Member States and industry; the studies will deal primarily with the short and medium-term outlook in those areas where the JRC has proven expertise. Consequently, only part of the staff will be from the JRC establishment plan, the remainder being seconded from industry and national bodies. In other words this is a joint activity between the Commission and industry, which needs to be developed gradually in the Commission's view.

This work will be carried out in close liaison with the other Commission services, particularly the FAST team whose operations and methods will be reviewed by the Commission, and with Directorate XII-H which will play a key role in coordinating the various actions of the Commission services in this area. An institute for prospective technology studies will be set up in

stages, with the JRC's own team in this sector providing the nucleus for future developments, initially it will be located on the Ispra site.

*
* *

2.4 JRC ACTIVITIES BEYOND 1991

2.4.1 The trend towards a reduction in the relative share of specific JRC research programmes in favour of other categories is likely to continue beyond 1991. This could lead to the following scenario in ten years time

JRC specific programmes	≤ 50%
JRC S/T support to the Commission's services)	35 - 50%
JRC services for third parties)	
JRC preparatory research	≤ 15%

The first two categories of activities will be increasingly interlinked, the JRC specific programmes will continue to be geared to the Commission's sectoral policies and to the evolution of the Framework Programme

2.4.2 The JRC specific research programmes are likely to undergo rather drastic changes in the course of the 1990's. Most of the present activities will come to an end during that decade and demand will most probably shift towards other research areas. That is why preparatory research activities during the period 1988-91 will be crucial to the future of the JRC and its continuing usefulness as a Community instrument

2.4.3 The new lines of development outlined above in paragraph 2.3.5 are intended, on the basis of the experience acquired during the start-up phase, to give rise to new, structured, activities clearly establishing the JRC's undisputed rôle in the overall context of Community activity.

2.4.4 The specific research programmes proposed for the period 1988-91 are expected to develop as follows

- Activities related to surveillance and the protection of the environment are likely to be increasing up to the end of the century; in particular, those related to the application of aerospace remote sensing will enter the era of more advanced technologies (new sensors, new equipment on board new platforms) and of abundant and sophisticated data to process.
- The emphasis on activities related to safety and the prevention and mitigation of accidents will have to be shifted gradually from the

nuclear to the non-nuclear sector. Even assuming that there will be a continuing need for research into the safety of light water reactors, if only because of the large number of such reactors in operation in the 1990's, part of the research carried out at the JRC in this field will be coming to an end in the 1990's. Developments in research into fast breeder reactor safety will depend on the future of this type of reactor. Radioactive waste research could be changed gradually into service activities for third parties (regional waste disposal authorities, nuclear industry) Research on safeguards and fissile materials management will be influenced by the evolution of the fuel cycle and is likely to continue at the same level in the next decade. Nuclear fuels and actinide research may undergo a change of emphasis but will maintain their character of basic research

- The fusion technology and safety programme, on the other hand, may be diversified according to the growing requirements of the European Fusion Programme.
- Research on industrial hazards could similarly be stepped up over the next decade.
- Advanced materials technology will continue to be a prerequisite for industrial growth in almost every industrial sector. It is thus safe to assume that a JRC responding to specific industrial needs will strengthen its presence in this important area.
- Activities related to the development of measurement methods and reference materials are needed for the development of standards which are essential for the creation of a large internal market. In this context, the 1992 deadline is merely a beginning and one can anticipate a steady increase in demand for more standards, more codes of practice, more regulations to remove the obstacles to the completion of the large internal market; this is bound to create more scientific and technical work in this sector.

It is clear from this outline of future JRC specific research in the 1990's that there will have to be a re-orientation of some 50% of current activities in less than 10 years from now. Such a rate of change is not unusual for scientific organisations. It is still a human and a financial challenge nevertheless.

3. A NEW MANAGEMENT FOR THE JRC

3.1 THE GENERAL FRAMEWORK

To carry out its new tasks, the JRC will need radical changes in its management methods. These changes must give it greater flexibility, greater autonomy - which does not rule out a stepping-up of post-auditing - and decentralisation of responsibilities.

Three aspects of JRC management are being examined particularly closely and have led or will lead to the application of new measures which are for the most part within the Commission's competence; these concern the internal structure of the JRC, its decision-making and consultative structure and its personnel policy. These measures are detailed below so that the Council can appreciate their scope.

3.2 THE INTERNAL STRUCTURE OF THE JRC

The principles underlying the Commission's thinking on framing of a new structure for the JRC can be summarised as follows :

- to endorse the recommendations of the Panel of Senior Industrialists to apply to the JRC the principle of a clearer separation between overall strategic, or programme, management on the one hand and the R&D activities, or resource management, on the other;
- to assign, accordingly, the highest possible degree of scientific, administrative and financial autonomy to the scientific units responsible for research,
- to demand, by the same token, maximum accountability from these scientific units,
- to give the scientific units a clearer identity and a more sharply-defined remit than in the past.

The main features of the internal structure which will result from the application of these principles are :

- a scientific infrastructure consisting of nine broadly autonomous scientific units. This infrastructure is not immutable : on the contrary it must be reviewed periodically, particularly as regards the number of scientific units, to respond to changes in the scientific requirements on the one hand and to the requests of internal and external clients on the other which could lead to a different kind of organisation in the interests of establishing a clear relationship between a particular client and his supplier,
- the corresponding abolition of the matrix-type structure of projects and disciplines at Ispra,
- a corresponding increase in the planning and monitoring functions of the Directorate General

It consists of :

A. A Directorate General in Brussels which will concentrate on the management of the programmes (following the Panel's recommendations) and will be responsible, inter alia, for the following tasks .

- the preparation and updating of the annual schedule of JRC activities, compatibility between JRC work and shared-cost actions and other Commission activities;
- the monitoring of outside scientific cooperation;
- the preparation and monitoring of the overall budget,
- general staff policy matters,
- the coordination of internal and external training policy (fellows);
- institutional relations,
- the coordination of publications and press relations;
- the introduction of structural measures conducive to a diversification of JRC activities, particularly the expansion of contract work for third parties;
- the internal coordination of informatics within the JRC.

It will rely for this purpose on units accountable directly to the Director-General of the JRC, and will also call on the relevant departments of DG XII-JRC responsible for personnel and budget matters, assessment, external relations and the press, and on the departments of DG XIII dealing with exploitation and utilisation of the results of research and technological development, technology transfer and innovation.

Moreover, the JRC Administration Directorate located at Ispra (see C below) will, in addition to providing joint support for institutes on the Ispra site, directly support the Directorate-General on matters relating to the JRC as a whole.

B. Nine Scientific Institutes

The distribution of the scientific institutes and their functions are shown below. In addition to carrying out work for third parties, taking part in Eureka projects and performing preparatory research, which are tasks common to all of these institutes, their specific tasks are as follows .

- 1) The Central Bureau for Nuclear Measurements at Geel is responsible in particular for

- . the specific programme of research on nuclear measurement methods and reference materials
 - . providing support for the Community Bureau of Reference and Euratom Safeguards
- 2) The Institute for Transuranium Elements at Karlsruhe is responsible in particular for
- the specific programme of research on nuclear fuels and actinides; the Institute also participates in the specific programme on radioactive waste management
 - . assistance for Euratom Safeguards
- 3) The Institute for Advanced Materials at Petten is responsible in particular for
- . the specific programme of research on materials, this programme will be carried out partly at Ispra by a unit directly under the Director of the Institute
 - . exploitation of the HFR reactor
- 4) The Institute for Environmental Sciences at Ispra is responsible in particular for
- . the specific programme of research on environmental protection, in particular projects related to chemicals in the environment, atmospheric pollution, water quality and chemical waste,
 - . the specific programme of research on radiation protection
 - . the specific programme of research on radioactive waste management
 - . assisting the Directorate-General for the Environment and the Directorate-General for Social Affairs (radiation protection)
- 5) The Institute for Remote-Sensing Applications at Ispra is responsible in particular for
- . the specific programme of research on the application of remote sensing techniques
 - . assisting the Directorate-General for External Relations, the Directorate-General for Agriculture, the Statistical Office and the Directorate-General for Development and the Directorate-General for Fisheries
- 6) The Institute for Safety Technology at Ispra is responsible in particular for
- . the specific programme of research on nuclear reactor safety
 - . the specific programme of research on reference methods for structural reliability assessment [buildings and industrial plant]
 - . the specific programme of research on fusion technology and safety

7) The Institute for Systems Engineering at Ispra is responsible in particular for

- . the specific programme of research on safeguards and fissile materials management and corresponding service activities for the Directorates-General for External Relations and for Energy (Euratom Safeguards)
- . the specific programme of research on reference methods for non-nuclear energies and support services in that field for the Directorate-General for Energy
- . the specific programme of research on industrial hazards
- . systems support for other Commission services

8) The Centre for Information Technologies and Electronics at Ispra is responsible in particular for

- . the operation of the Informatics Centre
- . maintaining for the JRC and for third parties a high level of expertise in the field of knowledge processing
- . providing support for other Commission services and third parties in association with the Directorate-General for Telecommunications, Information Industries and Innovation; the development of specific new applications to advanced data-processing systems.

The JRC could also act as host to the European Telecommunications Standards Institute set up under the auspices of the CEPT.

9) The Institute for Prospective Technological Studies is responsible in particular for

- . strategic studies of technological development at the request of industry, Commission departments or public and private national bodies
- . work necessary to the JRC's own prospective studies.

∴ Two support units - one technical, the other administrative - located at Ispra

The first is the Site Directorate covering, for the benefit of all the other units on the Ispra site, general infrastructure, radiation protection, safety, the central workshop and nuclear support services.

The second is the Administration Directorate of the JRC dealing with matters relating to

- personnel management
- the drawing up, execution and monitoring of the budget

- the formulation, introduction and development of common management methods, with particular regard to informatics
- contract management
- welcoming visitors to the Ispra site

As already indicated under A, this Directorate will provide a service not only for the units on the Ispra site, but also for the Directorate-General

*
* *

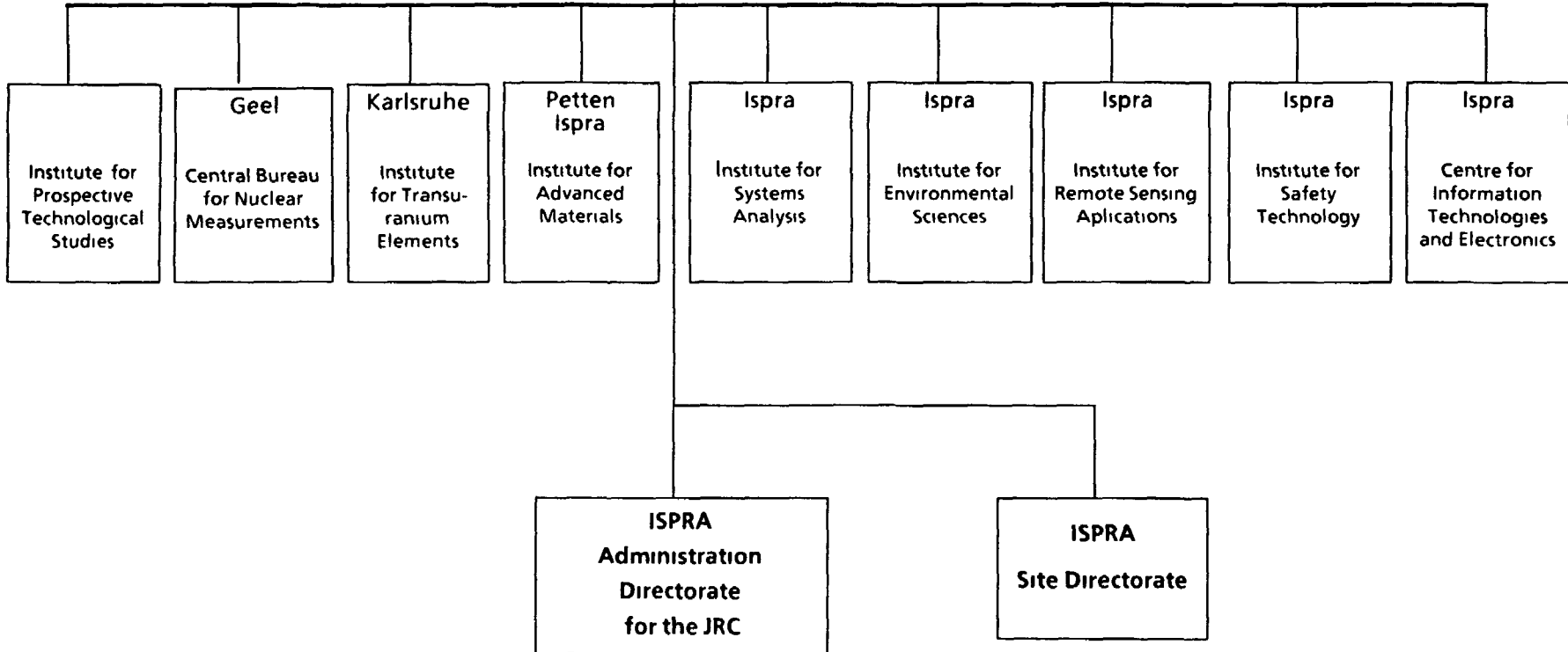
A structure of this kind, and especially one which involves devolving responsibility to the Scientific Units, is designed to lead to an optimisation of human resources, promote innovation and encourage a permanent quest for excellence.

The autonomy given to the Institutes means that each has full responsibility for the management of its research activities, staff and corresponding budget appropriations and purchasing, while still observing the general rules

Clearly this kind of arrangement must not preclude the possibility of close relations between the various component parts of the structure, and in particular between the Scientific Institutes, especially those on the Ispra site which will need to call on common resources. What this definitely must not do is recreate a matrix structure by any other name, on the contrary, it must generate the necessary synergy effects and avoid duplication

JRC INTERNAL STRUCTURE

**BRUSSELS
DIRECTORATE GENERAL**



3.3 DECISION-MAKING AND CONSULTATIVE STRUCTURE

3.3.1 The Commission's approach here is based on the need to ensure that the JRC can, firstly, take the rapid decisions needed if it is to operate more like a business than a government department, and secondly, have access to scientific and technical opinions which will ensure that the work of the JRC is geared to the Community's real needs

The proposed system is based on the following criteria .

- strengthening of the powers of the JRC Board of Governors,
- abolition of the existing Scientific Council,
- setting-up of advisory committees for the Scientific Institutes to provide them with specialised scientific opinions

3.3.2 The JRC Board of Governors

The Commission proposes that, once the multiannual decision has been taken by the Council, the Board of Governors should have the power to decide on any adaptations to it and to play a central rôle as regards JRC affairs.

The Board of Governors would continue to have 13 members - a chairman and one representative per Member State - and where necessary would call on high-level experts from science and industry in the Community.

Every autumn the Board of Governors would approve the work schedule presented by the JRC Director-General for the following year; this would cover all the activities to be carried out, specific programmes, support for the Commission, contracts with outside bodies and preparatory research.

The Board of Governors would advise the Director-General of the JRC on all questions relating to the operation of the Centre, in particular the selection of visiting scientists and fellows and the preparation of budgets. It would also be responsible for delivering a formal opinion on the preliminary draft budget. It will deliver an opinion to the Commission on the organisation of the JRC evaluation as set out in Annex II

Thus the Board of Governors would play a more influential rôle than at present

3.3.3 The Advisory Committees for the Scientific Institutes

The rôle of these Committees is to ensure through their opinions that the work of the Institutes is geared to the real requirements of their customers and users and that a high scientific standard is maintained within the Institute

The Commission considers that these Advisory Committees should have no more than 10 members :

- the Chairman, who would automatically be the Director of the Institute,
- six members from the scientific and industrial world in the Community,
- three members from within the Commission.

As far as the six members from the Community are concerned, although there will be no fixed geographical allocation - since priority must be given to expertise and the interests of users - care should nevertheless be taken to ensure that the interests of all the Member States are broadly represented on those Committees, in addition it would be advisable for at least one member - either the chairman or a member - of the CGC whose area of responsibility is closest to the tasks of the Institute, to serve on the Advisory Committee.

Of the three members from within the Commission, one should come from the personnel of the Institute itself and the other two from the Directorates-General most directly concerned either by virtue of the policy areas for which they are responsible or in their capacity as customers for the research in question.

3.3.4 Contacts with other Advisory Committees

Under the EAEC Treaty, Euratom's Scientific and Technical Committee (STC) will continue to be consulted on research programmes pursuant to the Treaty. As indicated in point 2.3.1 above, the STC will see that the themes selected for these programmes are geared to the needs of the customer, who in this case is essentially the Community at large. The Committee for Scientific and Technological Research - CREST - is required, for the specific research programmes covered by the EEC Treaty, to play a similar rôle to that of the STC for the nuclear part, namely to ensure that the themes selected meet the customer's (i.e. the Community's) needs.

For the JRC's fusion activities, opinions will be obtained from the Fusion Technology Steering Committee which covers all Community activities on the subject.

In addition, periodic consultations will be maintained with the appropriate CGCs so as to ensure, where necessary, coordination with shared-cost projects and national activities in the same field. The presence on the Advisory Committees for the Scientific Institutes of the Chairman or one of the members of the CGCs most involved would further strengthen that coordination.

3.3.5 Scientific consultation within the JRC

Within the JRC it is important that there should be a dialogue between management and scientific and technical personnel on the scientific and technical content of the JRC's activities, it is intended that there should be a Scientific Committee for the JRC as a whole which would rely on local committees, one for each Scientific Institute. The Commission decision on this subject will be reviewed.

3.4 A NEW PERSONNEL POLICY FOR THE JRC

3.4.1 All the measures outlined above are aimed at instituting a radical change in the JRC. There is no doubt that this will entail new responsibilities for every member of staff, requiring a change in the staff and management behaviour at all levels and facing everyone with new challenges. That has been the experience of other organisations which have undergone changes in dimension or outlook. Clearly the whole process can be made easier by taking appropriate measures, such as providing the fullest possible information, reducing periods of uncertainty, etc.

We visualise the JRC as a far more dynamic entity in the future than it is at present, which will mean continual demands on its ability to adapt, a continuing need to consolidate its existing expertise and then to develop new expertise.

3.4.2 Personnel policy will have to be redefined within the framework of the existing Staff Regulations. This redefinition is warranted by the requirements of the new scientific objectives.

Within the framework of the current staff system (Staff Regulations for officials and other servants), provision must be made for the following :

- a) continuation of the current policy of recruiting scientific and technical staff on a temporary basis, there is no need for a new decision on this issue;
- b) a clear policy intended to maintain scientific vitality by non-renewal of the contracts of some of the staff, involving the fixing of a fairly high non-renewal rate; this policy must be combined with an appropriate recruitment policy (an internal organisational decision by the Commission will be required for this);
- c) introduction of a system of temporary secondment (for a maximum of 3 years) for scientific and technical personnel from the public and private sectors in the Member States to the Commission and vice-versa (an arrangement of this kind already operates for the Commission's administrative staff). The introduction of this new system will require a decision by the Commission and a decision by the budgetary authority for the purpose of releasing the appropriations;

- d) measures to promote the mobility of officials within the JRC and, as far as possible, from the JRC to other Commission services (an internal organisational decision by the Commission will be needed),
- e) the setting up of new systems for receiving visiting scientists, fellows, etc,
- f) the introduction of special arrangements for termination of service in respect of officials whose qualifications do not match the new scientific objectives (adoption of the regulation by a majority Council decision, and a decision by the budgetary authority on the appropriations).
- g) the institution of retraining schemes for JRC personnel to facilitate their adjustment to new tasks;
- h) the creation of more opportunities for JRC scientific staff to lecture in higher education establishments, establishing a link with academic circles which can only enhance the scientific vitality of the Centre,
- i) the conversion of a number of B and C grade (scientific/technical) posts into A grade (scientific/technical) posts. This is to make allowance for the increase in scientific tasks requiring more conceptual staff and the need for fresh expertise;
- j) study of the scope for reducing the number of administrative personnel by transferring individuals with their posts to the general budget (which will require a decision by the budgetary authority) or by taking other measures (which might require a decision by the budgetary authority);
- k) the introduction of new methods of reducing red tape and controlling costs in order to lower overheads.

3.4.3 The underlying objective of every one of these measures is to ensure that the staff have the right scientific and technical skills and the necessary motivation.

The implementing texts will be proposed by the Commission at the end of November 1987, once it has received the conclusions of the joint Commission/JRC Board of Governors Working Party.

4. EVOLUTION OF JRC RESOURCES

4.1 TRENDS IN TOTAL RESOURCES

Chapter 2 of this document describes the various distinct tasks which will make up the JRC's future activities, together with an indication of their relative share of the total resources.

With changes as radical as those envisaged for the JRC, it is important at all times to bear the long-term perspectives in mind and to match these against the present situation and the goals to be achieved during the period 1988-91.

The various discussions and surveys carried out over a period of more than one year on the future activities of the JRC have convinced the Commission of the need to set itself the following objectives.

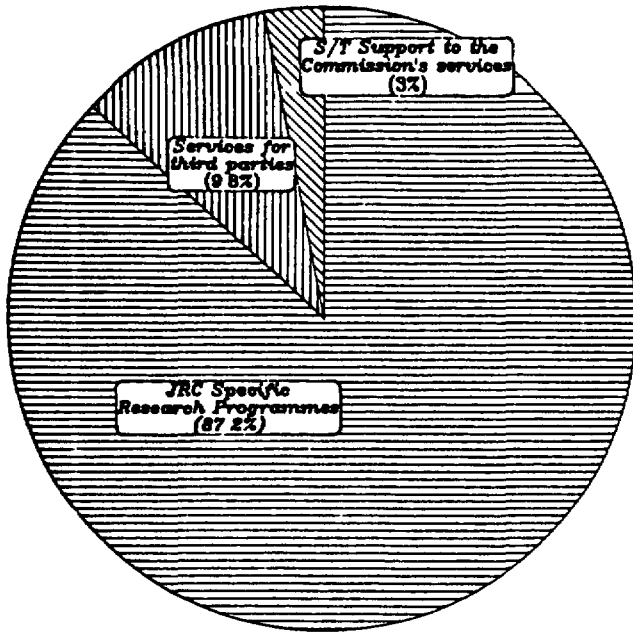
These objectives take account of the need to press ahead with the changes to the JRC and of the constraints which militate against too sudden a change.

Table 3

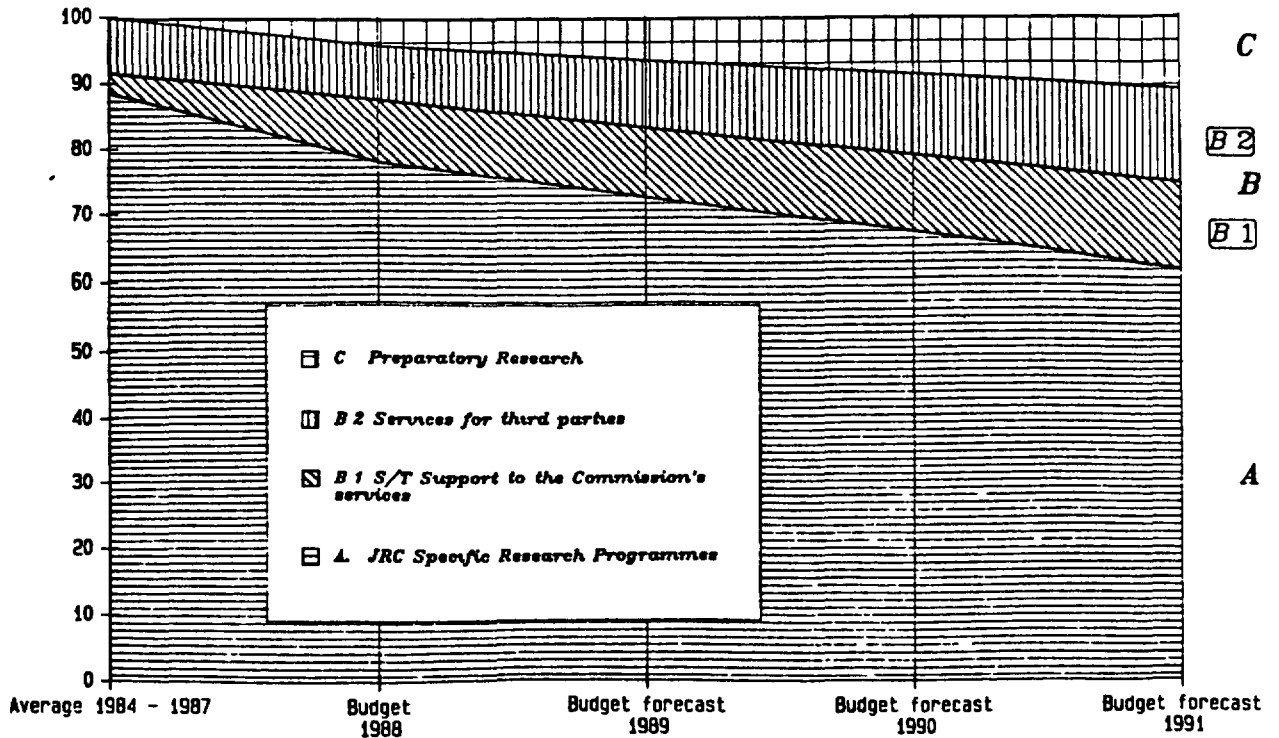
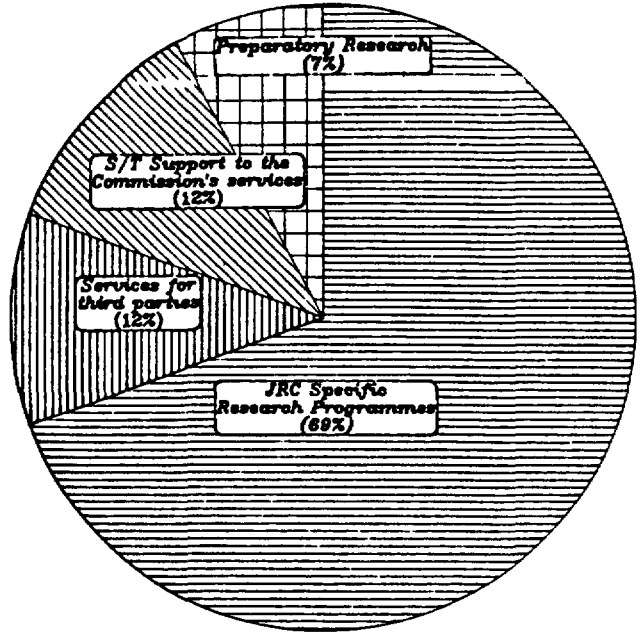
	1984-87 average %	1988-91 average %	1991 target %	Target in 10 years %
A. Specific research programmes	87.2	69	61	< 50
B. Work for third parties				
B.1 S/T support to the Commission	3	12	14	
B.2 Work for external private or public bodies	9.8	12	14	
Total	12.8	24	28	35-50
C. Preparatory research	0	7	11	< 15
Total	100	100	100	100

These goals are also illustrated in the following figures. From 1988 onwards, there will be a dynamic evolution during which the importance of specific programmes will be decreasing as the importance of other tasks grows. This applies to the 1988-91 period illustrated in the graph, which also indicates the goals for 1991.

1984-1987 average



1988 - 1991 average



The following comments apply to these illustrations

- The percentages indicated for 1984-87 and for 1988-91 are averages.
- The work providing S/T support for Commission services is work which has to be carried out in any event as part of the implementation of the Community policies for which those services are responsible. The Joint Research Centre is to be chosen to carry out these tasks because of the expertise at its disposal, its neutrality and independence of judgement and the flexibility of project management due to the close links between the JRC and the other Commission services. As this work is entrusted to the JRC over the course of time, it will come to constitute an asset. This asset can then be matched by savings in those sections of the budget relating to the policies concerned. In other words, were this work to be carried out elsewhere, the necessary funding would have to be found from other sections of the Commission budget. The Commission's proposal thus has the effect of increasing budgetary transparency,
- preparatory research, as its name implies, is a non-specific activity which, in common with other activities of the same kind, is not part of the specific programmes adopted under the Framework Programme. Hence, it will be the subject of an entry in the Commission budget,
- The increase in work for third parties over the period 1988-91 might appear quite small. It includes the exploitation of the HFR reactor as part of a supplementary programme involving the Netherlands and Federal Republic of Germany and other sources of financing from Community programmes and other third parties. Within the work for outside bodies, the HFR represents an income of 83 MECU for 1988-91 (plus the contribution of 7 MECU from the JRC specific programmes).

Apart from the supplementary programme HFR, the income is very small at present - less than 3 MECU over the last four years compared to a target of 40 MECU for 1988-91. In fact, the target shown is obtained by multiplying by 13 the income from customers in respect of work for third parties.
- The Centre's long-term goals cover a period of eight to ten years. These plans will be updated continuously in the light of the development of the Community and general economic trends.
- The table and graphs illustrate the evolution of the three central tasks of the JRC (A,B,C). Chapter 2 of this document also describes others (execution of EEC additional programmes, JRC as host for major scientific installations as part joint ventures etc). Should such tasks materialise in the future, they would increase the share accounted for by work for outside bodies.

Table 4 illustrates the overall resources proposed for the whole JRC for the 1988-91 period in absolute terms, year by year, with an indicative breakdown between the three main task areas and an indicative breakdown of the average total staff estimated to be necessary to execute these tasks.

Table 4

Tasks	Appropriations MECU	Estimated average Staff
A. Specific research programmes	690	1 610
B. Work for third parties		
B.1 S/T support to the Commission	120	250
B.2 Work for external private or public bodies	118	200
Total	238	450
C. Preparatory research	70	200
Total	998	2 260

Comments on Table 4 .

- The amount considered necessary for the specific programmes to be adopted under the decisions proposed in Chapter 5 is put at 690 MECU. The Commission would point out that, in order to maintain the balance established in Annex I of the Framework Programme decision, the ratio between the amounts deemed necessary for each activity and sub-activity must remain constant, pending a decision on the addition of the remainder of 417 MECU which, in the Commission's view, must be taken by 31 December 1987 whatever happens. Consequently, the contribution from JRC specific programmes to the amount of 417 MECU is 53 MECU.
- Funds are shown for the whole 1988-91 period. Annual schedules of activities and budget proposals will be drawn up on the basis of the dynamic trends illustrated.
- The amounts are given in current values and are based on the assumption of a 4% annual depreciation in the purchasing power of the ECU. Thus there is no provision, unlike in previous JRC programmes, for an automatic review of the total funding while the programme is running, to allow for the indexation of staff costs.
- The totals are based on maintaining the current level of JRC activities throughout the 1988-91 period.
- The funds include appropriations for the training of staff for the new range of JRC activities. The budget proposal for 1988 alone earmarks 0.8 MECU for this purpose and at least as much will be necessary for the following years.

- Over the 1988-91 period, it is intended to reserve about 0.5 MECU for the evaluation of research performed under the specific research programmes and preparatory research.
- The budget estimates allow for expenditure for the marketing of JRC activities, which will amount to around some 2 MECU per year for the period 1988-91.

4.2 SPECIFIC PROGRAMMES

Details of resource allocation during the period 1988-91 for the specific programmes falling under the Framework Programme for Scientific Research and Technological Development (1987-91) are given in Table 5.

Table 5

Appropriations in MECU

1. Quality of life		
1.2 Radiation Protection	2.8	
- Evaluation and monitoring of radioactivity		2.8
1.3 Environment	136.0	
- Environmental Protection		71.4
- Application of Remote Sensing Techniques		36.5
- Industrial Hazards		28.1
3. Modernisation of Industrial Sectors		
3.2 Science and Technology of Advanced Materials	60.5	
- Advanced Materials		60.5
3.4 Technical Standards, Measurement Methods and Reference Materials	120.8	
- Nuclear Measurements and Reference Materials		75.6
- Reference methods, reliability of structures		34.6
- Reference Methods for Non-Nuclear Energies		10.6
5. Energy		
5.1 Fission : Nuclear Safety	309.9	
- Reactor Safety		147.9
- Radioactive Waste Management		48.5
- Safeguards and Fissile Materials Management		44.5
- Nuclear Fuels and Actinide Research		69.0
5.2 Controlled Thermonuclear Fusion	60.0	
- Fusion Technology/Safety		60.0
Total	690.0*	

* including a blocked amount of 53 MECU

Comments on Table 5 :

- The specific programme "Evaluation and Monitoring of radioactivity" is scheduled for 1988 only, this is a research action begun in 1986-87 following the Chernobyl accident. Once it is set up, this action will become an action providing scientific and technical support for the Commission (particularly DG V). In the case of the specific programme "Reference methods for non-nuclear energies, which is based on a research project that has been in progress for a number of years and includes the exploitation of an experimental facility (ESTI), only part of the funding is provided for under the specific programme. The additional resources needed will be provided through other JRC functions, in particular via customers in national bodies or industry and via scientific and technical support activity for the Commission (DG XVII).
- The figures in Table 5 include the appropriations earmarked for contractual actions, in particular
 - * an amount of 20 MECU for the execution within the JRC budget of shared-cost actions in the field of reactor safety;
 - * contracts placed with national laboratories amounting to 2 MECU for the programme on structural reliability,
 - * contracts placed with outside bodies for the programme on the application of remote sensing techniques.
- In addition, it should be noted that under the heading of JRC scientific and technical support for the Commission it is intended to place contracts amounting to around 16 MECU to support the action on the application of remote sensing techniques to the Community's agricultural policy. In all, the Joint Research Centre will redistribute some 45 million ECU under contracts placed with bodies in the Member States of the Community from 1988 to 1991.
- The amount earmarked for investment under the specific programmes is of the order of 24 MECU or 3.5% of the total funding for these programmes; this is a low figure which reflects the austerity of the financing assumptions. As regards the work for outside bodies, it is proposed to set up a 5 MECU fund outside the programme to be used for the investments which are necessary to attract customers. This fund, entered in the Community budget, would be gradually paid off by making allowance for the amortisation of the investments in the amounts invoiced to the third parties for the services. It is also proposed that an amortisation factor should systematically be introduced in the JRC's internal invoicing system.

As regards financial management, a new system of cost control will be introduced. It will involve, in particular, a strict evaluation of overheads, making the Scientific Institutes responsible as far as possible for keeping a tight rein on overheads. The administrative restructuring process will thus go hand in hand with a financial reorganisation based on "cost centres" and modelled on the "project centres" in industry

4.3 BUDGETARY IMPLICATIONS

4.3.1 The necessary appropriations will be entered in the general budget of the European Communities.

- Staff and administrative appropriations will be shown as a separate item in the section for Commission staff and administrative appropriations.
- Operating appropriations will be entered under the Research section in the general budget.

4.3.2 A distinction will be made between operating appropriations for the implementation of

- Specific research programmes adopted by the Council pursuant to Article 7 of the EAEC Treaty and Article 130 Q(2) of the EEC Treaty,
- the supplementary EURATOM programme for the operation of the HFR reactor,
- scientific and technical support for other Commission departments,
- research work in preparation for new activities;
- services for third parties

A p.m. will be entered against the item for these services, with the exception of certain capital expenditure necessary to obtain certain third party contracts which will be gradually repaid through the revenue from these contracts (see comments on p. 38). An amount of additional appropriations will be assigned to this item during the financial year equivalent to the amount of the revenue to be entered in the statement of revenue in the corresponding section of the general budget.

A p m will likewise be entered under the item relating to operating appropriations for the HFR supplementary programme. An amount of additional appropriations will also be assigned to this item during the financial year equivalent to the amount of revenue to be entered in the statement of revenue in the corresponding section of the general budget.

4.3.3 A similar distinction will be made for the staff and administrative appropriations. An amount equivalent to the staff and administrative costs incurred in providing services for third parties (including those provided under the HFR supplementary programme) will be reinstated in the general budget

4.3.4 Pursuant to Article 20(3) of the amended proposal for the Financial Regulation, the staffing levels necessary to perform the tasks conferred on the JRC will be shown in the staff tables annexed to the budget. The recruitment of staff will be authorised within the limits of the budget appropriations.

In the case of staff assigned to the provision of services for third parties, account must be taken of the need to have available a small pool of staff not necessarily involved in providing these services, but who will play a part in obtaining the contracts and who must be immediately available for the execution of the contracts once they have been obtained.

5. PROPOSALS FOR COUNCIL DECISIONS

This section contains the proposals for Council Decisions on the specific research programmes under the EEC Treaty and the EAEC Treaty respectively, and the proposal for a decision on the supplementary programme : Exploitation of the HFR reactor at Petten, under the EAEC Treaty.

Proposal for a
COUNCIL DECISION

adopting specific research programmes to be
implemented by the Joint Research Centre
for the European Economic Community (1988 to 1991)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,
and in particular Article 130 Q(2) thereof,

Having regard to the proposal from the Commission¹,

In cooperation with the European Parliament²,

Having regard to the opinion of the Economic and Social Committee³,

Whereas, in adopting the framework programme of Community activities in the
field of research and technological development (1987 to 1991), the Council
acknowledged the importance of activities relating to the environment, the
science and technology of advanced materials, technical standards, measure-
ment methods and reference materials,

Having regard to the opinion of the Scientific and Technical Research Committee (CREST),

HAS DECIDED AS FOLLOWS:

Article 1

The specific research programmes, hereinafter referred to as "the
programme", set out in Annex A are hereby adopted for a period of four
years, starting on 1 January 1988.

Article 2

The expenditure commitment estimated to be necessary for the execution
of the programme is 241.7 million ECU, including expenditure on a staff of
not more than 670.

An indicative breakdown of this amount is given in Annex A.

1 OJ ...

2 Opinion delivered on ../../...; (approval), (amendments)

3 Opinion delivered on ../../..., OJ n° ...

Article 3

The Commission, assisted by the Board of Governors of the Joint Research Centre (JRC), shall be responsible for carrying out the programme and, to this end, shall call upon the services of the JRC.

Article 4

The Commission shall submit to the Council and to the European Parliament the results of an evaluation organized by the Commission, after having sought the opinion of the Board of Governors of the JRC. The said evaluation must be available during 1991.

Article 5

The Commission, assisted by the Board of Governors of the JRC, shall each year prepare a report for the Council and the European Parliament on the execution of the programme.

Done at Brussels,

For the Council

The President

ANNEX A

Specific EEC research programmes (1988-91)
of the Joint Research Centre

Indicative breakdown of resources
(Appropriations in million ECU)

1. Quality of life		
1.3. Environment	136.0	
- environmental protection		71.4
- application of remote-sensing techniques		36.5
- industrial hazards		28.1
3. Modernization of industrial sectors		
3.2. Science and technology of advanced materials	60.5	
- advanced materials		60.5
3.4. Technical standards, measurement methods and reference materials	45.2	
- reference methods, reliability of structures		34.6
- reference methods for non-nuclear energies		10.6

Total	241.7	

Proposal for a
COUNCIL DECISION

adopting specific research programmes to be
implemented by the Joint Research Centre
for the European Atomic Energy Community (1988 to 1991)

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 of the Scientific and Technical Committee,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas, in adopting the framework programme of Community activities in the field of research and technological development (1987 to 1991), the Council acknowledged the importance of activities relating to radiation protection, technical standards, measurement methods and reference materials, nuclear fission: nuclear safety and controlled thermonuclear fusion;

Whereas in the context of the common policy relating to the field of science and technology, research programmes are one of the principal means whereby the European Atomic Energy Community can contribute to the safety and development of nuclear energy and to the acquisition and dissemination of information in the nuclear field,

HAS DECIDED AS FOLLOWS.

Article 1

The specific research programmes, hereinafter referred to as "the programme", set out in Annex A are hereby adopted for a period of four years, starting on 1 January 1988.

Article 2

The expenditure commitment estimated to be necessary for the execution of the programme is 448.3 million ECU, including expenditure on a staff of not more than 1160.

An indicative breakdown of this amount is given in Annex A.

Article 3

The Commission, assisted by the Board of Governors of the Joint Research Centre (JRC), shall be responsible for carrying out the programme and, to this end, shall call upon the services of the JRC.

Article 4

The Commission shall submit to the Council and to the European Parliament the results of an evaluation organized by the Commission, after having sought the opinion of the Board of Governors of the JRC. The said evaluation must be available during 1991.

Article 5

The Commission, assisted by the Board of Governors of the JRC, shall each year prepare a report for the Council and the European Parliament on the execution of the programme.

Done at Brussels,

For the Council

The President

ANNEX A

Specific Euratom research programmes
of the Joint Research Centre

Indicative breakdown of resources
(Appropriations in millions of ECU)

1. Quality of life		
1.2. Radiation protection	2.8	
- evaluation and monitoring of radioactivity		2.8
3. Modernization of industrial sectors		
3.4. Technical standards, measurement methods and reference materials	75.6	
- nuclear measurements and reference materials		75.6
5. Energy		
5.1. Fission : nuclear safety	309.9	
- reactor safety		147.9
- management of radioactive waste		48.5
- safeguarding and management of fissile materials		44.5
- nuclear fuels and actinoides research		69.0
5.2. Controlled thermonuclear fusion	60.0	
- fusion technology and safety		60.0

	Total	448.3

Proposal for a
COUNCIL DECISION

adopting a supplementary research programme
to be implemented by the Joint Research Centre
for the European Atomic Energy Community

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 of the Scientific and Technical Committee,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas, in the context of the common policy relating to the field of science and technology, the research programme is one of the principal means whereby the European Atomic Energy Community can contribute to the safety and development of nuclear energy and to the acquisition and dissemination of information in the nuclear field,

HAS DECIDED AS FOLLOWS:

Article 1

The supplementary programme on the operation of the high-flux research reactor (HFR), hereinafter referred to as "the programme", is hereby adopted for a period of four years, starting on 1 January 1988.

Article 2

The expenditure commitment estimated to be necessary for the execution of the programme is 71.5 million ECU. This amount also includes expenditure on a staff of 82.

An indicative breakdown of this amount is given in Annex A.

Article 3

The Commission, assisted by the Board of Governors of the Joint Research Centre (JRC), shall be responsible for carrying out the programme and, to this end, shall call upon the services of the JRC.

Article 4

The Commission, assisted by the Board of Governors of the JRC, shall each year prepare a report for the Council and the European Parliament on the execution of the programme.

Done at Brussels,

For the Council

The President

ANNEX A

Indicative breakdown of resources for the HFR

The resources to be contributed to the supplementary programme are broken down as follows :

Federal Republic of Germany	50 %
Netherlands	50 %

Other resources are provided for, in addition to the supplementary programme, either under the heading of work carried out as part of the JRC specific programmes or under the heading of work for third parties.

The indicative breakdown is as follows :

Supplementary programme		78 MECU
- Federal Republic of Germany	39.0 MECU	
Netherlands	32.5 MECU	

total appropriations	71.5 MECU	
- Netherlands (in kind and services)	6.5 MECU	
JRC specific programmes and third parties (estimated resources)		12 MECU

	Total	90 MECU

6. CONCLUSION

The Commission calls on the Council and Parliament to take note of the measures it has in view in order to secure a stable future for the Joint Research Centre by means of a thoroughgoing reform of its operation.

In this connection it requests the Council and Parliament to take the decisions proposed in this document

**SCIENTIFIC AND TECHNICAL ORIENTATIONS
FOR SPECIFIC PROGRAMMES AND SUPPORT ACTIVITIES OF THE JRC**

This annex describes the specific programmes of the JRC and gives an overview of JRC scientific and technical support to the services of the Commission.

1. Specific JRC Research Programmes 1988-91

The JRC multiannual specific research programmes will be carried out according to the scientific and technical orientations described below which cover the full range of possible future JRC activities. In reality the future discussions with users and customers are bound to alter these orientations, and financial and human resources will be concentrated on activities selected according to demand.

These specific research programmes were drawn up after a detailed examination of the requirements in terms of Community research. The conclusions from that analysis was, as has already been mentioned, that the JRC will be required, in keeping with its institutional role and its scientific and technical capabilities, to carry out work on the following themes

- the contribution to the creation of a large internal Community market;
- the enhancement of safety and the prevention and mitigation of accidents,
- surveillance and protection of the environment.

1.1 The heading "Contribution to the creation of the internal market" and its counterpart "Improvement of industrial competitiveness" covers research into the development of measurement methods and reference materials and also the work on advanced materials.

Research into the development of measurement methods and reference materials includes research on reference measurements and materials, on reference methods for structural reliability assessment and work on reference methods for non-nuclear energy.

The work on nuclear measurements and reference materials at the JRC Geel will continue in order to meet the needs identified by the European organisations (Community Fusion Programme) and international organisations (OECD - NEA, IAEA) and in response to requests from industry, research institutes and medical bodies in the Community. The work on reference materials will similarly lead to a comparison of its results with those of national bodies and industry. Data work is likely to increase in the field of fusion technology alongside the traditional nuclear fission activities.

The conditioning, storage and distribution of non-nuclear materials to customers is a direct support to the Community BCR (Community Bureau of Reference), it will continue in the coming years under a special arrangement with the BCR programme.

The general aim of the proposed research on reference methods for structural reliability assessment is to contribute to a better understanding of the behaviour of structures exposed to severe loading. Existing physical methods and techniques will be used for the non-destructive measurement of damage and for the evaluation of the dynamic properties of materials, with the aim of constructing models to predict in-service reliability and the residual life of components and assemblies in complex large structures.

Studies of the non-linear behaviour of structures and mechanical systems exposed to severe dynamic loading will be continued and expanded

This will permit the formulation of improved design specifications and reliability assessment in such diverse fields as civil, mechanical, nuclear, chemical, coastal and offshore engineering. The ultimate aim of this research is to enhance the safety and design of structures and mechanical systems in a cost-effective manner.

With this end in view, it is proposed to supplement the testing capacity existing in the Community through the construction at the JRC Ispra of a reaction wall facility to allow static, cyclic and pseudodynamic testing of large-scale or full-scale models of structures.

This research activity will be coordinated by a user group made up of experts from the national institutions, which will assist the JRC to set priorities and to disseminate results

Other work relating to the study of measurement methodologies for assessing the performance of solar energy systems using ESTI, the specialised facility at Ispra, will be completed in the early part of the 1988-91 period as a specific programme activity. The expertise acquired from this programme will subsequently be made available to the Commission, customers in industry and national governments.

The work on the study and development of advanced materials will be carried out at Petten and Ispra.

The work planned at the Petten Establishment, largely an extension of current activities, includes the study of mechanical properties and corrosion of structural steels and alloys at high temperatures in simulated environmental conditions, the study of alloy subcomponents under complex creep conditions and the behaviour of high temperature ceramics and composites in corrosive atmospheres. The High Temperature Materials Data Bank will be extended to other materials systems, including ceramics, with a view to rapid expansion in industrial usage. The Materials Information Centre will ensure early dissemination of

results and data to potential users and act as a permanent interface with industry.

The activities of the Ispra Establishment will cover property and performance assessment in improved conventional materials as well as advanced structural and functional materials (such as special steels, intermetallics, composites and ceramics).

There are plans to launch a project on the structural and chemical characterisation of high-temperature superconducting ceramics and, in addition, an activity on the chemical and microstructural surface modulation of metals and ceramics using ion beam and laser techniques.

1 2 Under the heading "Enhancement of Safety, Prevention and Mitigation of Accidents", the JRC will concentrate on the following activities

- nuclear fission safety, i.e. reactor safety, fissile materials control, radioactive waste management, research on actinides and safety of nuclear fuels,
- safety-related aspects of fusion technology,
- safety of conventional industrial activities, particularly the evaluation and prevention of industrial hazards, and transport.

In the field of nuclear fission safety, research into reactor safety will continue to play an important part, but with modified priorities taking account of the maturity of nuclear technology and the lessons learned from recent developments and events such as the Chernobyl accident. The research will concentrate on accident prevention and accident analysis, control and mitigation for the benefit of the public, the nuclear industry and the regulatory authorities. In comparison with the 1984-87 programme, activities related to reactor safety will be reduced. All of these activities will be defined in collaboration with national laboratories, industry and the regulatory authorities.

The accidents at Three Mile Island (USA) and Chernobyl (USSR) have re-emphasised the need to reach a consensus on how to determine the amount and species of fission products (source term) which would be released to the environment in case of a hypothetical failure of the containment.

The Commission intends to make a substantial contribution to the solution of this problem by launching shared-cost action projects, as part of a specific JRC programme, in which in-pile demonstration tests will be prepared in the French Phebus reactor and organisations concerned in the Community will be invited to participate in the development and assessment of "code packages".

The research on the safety of radioactive waste management fits into a twelve-year action plan of the Community ending in 1992. In this sector the JRC will continue studies on alternative waste management strategies and will conduct advanced studies related to the long-term

risks inherent in geological disposal. These will be performed in close collaboration with national laboratories and industries and will gain new impetus from the PETRA installation for the evaluation and treatment of radioactive waste. The future use made of this facility will be determined by the interests of its prospective customers including those from industry.

The work on control of fissile materials (safeguards) fulfills the Community's obligation to implement safeguards under the Euratom Treaty, the Non-Proliferation Treaty and nuclear material supply agreements with third countries. It is not the JRC's role to perform the Euratom Treaty inspection, which is entrusted to another Directorate-General (Directorate-General for Energy), but the JRC does provide substantial technical support to this Directorate-General and, through its advanced research, the necessary scientific background. These activities are performed in cooperation with the IAEA and with the US Department of Energy. The PERLA (Performance and Training Laboratory) facility in Ispra will be an important asset to this programme.

The basic actinide research conducted in the JRC Karlsruhe Establishment enjoys a world-wide scientific reputation and leads to close contacts with many laboratories, and not exclusively in academic circles. Hand in hand with this research is the work on the safety of the fuel cycle, including the work on actinide formation and transmutation studies and the work on the safety of nuclear fuels. The latter has already given rise to extensive contacts and collaboration with industry and national research laboratories throughout the Community, and there is a clear potential for a further intensification of this cooperation.

The research into safety-related aspects of thermonuclear fusion will continue to be conducted for the benefit of the European Fusion Community, and to this end much of the Ispra-based work will be focused on work planned for the NET (Next European Torus). Safety and environmental studies are included in these activities from the outset as requested by the European Parliament. During the coming years, the construction of the Tritium Handling Laboratory in Ispra will continue in accordance with the planning already established for this facility.

The research on safety of industrial activities was initiated in the current JRC multiannual programme, and addresses the risks associated with conventional industries such as the processing and energy-conversion industries. Various major accidents in the world have since increased public awareness of the need to exercise stricter control over operations representing a potential risk to health and the environment, and the Community has responded by issuing new directives. This need continues to be evident. The objectives of the JRC work are and will continue to be relevant to industry and to the implementation of the Community policy on major hazards, particularly the regulatory work of the Directorate-General for Environment, Consumer Protection and Nuclear Safety.

1.3 Under the heading "Surveillance and protection of the environment" the following areas will be studied .

- research related to environmental protection proper, as defined in the Fourth Community Action Plan,
- the application of remote sensing techniques,
- activities related to radiological monitoring.

The activities related to the protection of the environment cover environmental chemicals, atmospheric pollution, water quality and chemical waste. The environmental chemicals project deals with the continuous updating of the ECDIN data bank on chemicals in the environment, and their evaluation, as well as research on the effects of trace metals and on indoor air pollution. The atmospheric pollution research is focused on the atmospheric chemistry of pollutants, on the evaluation of methodologies for the measurement of atmospheric pollutants and on in-field studies of pollutant mass balance and transport; moreover, studies will be pursued on the prediction of specific aspects of climatic changes due to the increase in CO₂ concentration. The water quality project covers bioindicators, ecotoxicological effects and pathways of trace metals in aquatic ecosystems. The potential benefits of setting up an ecotoxicology reference laboratory will be examined. The chemical waste project includes studies on the migration of inorganic and organic pollutants from waste deposits and their possible impact on the environment; it also includes the developments of a support system for the management of highly toxic wastes

The programme on aerospace remote sensing techniques will be oriented towards applications of conventional remote sensing techniques in selected areas and towards the development of the use of new, more advanced techniques.

Applications of conventional remote sensing techniques will be geared to user demand. Apart from a specific action instigated by DG VI and the Statistical Office in 1987 on European agricultural production, the work on the land-based applications of remote sensing techniques will cover land use in peripheral regions of Europe and land resources management in regions of Africa. New applications could include ore prospecting at the request of the Member States.

As for marine applications, the emphasis will continue to be placed on methods for the surveillance of marine pollution and the monitoring of fishery resources as part of campaigns conducted in collaboration with national laboratories, with DGI and DG XI as primary users, and at the request of DG XIV. Studies of air/sea interaction could be included.

Work on the utilisation of more advanced remote sensing techniques will be focused on microwave techniques for remote sensing and on laser-induced fluorescence. Experimental measurement campaigns will be organised in cooperation with the ESA in order to promote the use of data obtained by the first European Remote Sensing Satellite ERS 1.

The activities relating to radiological monitoring provide support for the specific activities provided for in the Euratom Treaty (Chapter 3)

and are coordinated with Commission shared-cost actions. These activities include the setting up of a data bank with information on the environmental characteristics and the biological effects of radionuclides and mathematical models to calculate the distribution of radionuclides released from a nuclear accident. These activities will become scientific activities to support DG V in 1988. They will take account of similar activities developed by certain UN agencies, such as IAEA and WMO¹.

2. JRC scientific and technical support to the Commission

A large proportion of the JRC's expertise is relevant to the various sectoral policies of the Commission and can be used to provide, on a larger scale than in the past, a scientific and technical support activity to the services of the Commission in charge of these policies. Such activities are being streamlined according to the customer/contractor principle. Various types of activity which are already clearly defined are summarised below.

2.1 Support for Monitoring by remote sensing in developing countries (DG I - DG VIII)

This JRC S/T support will consist essentially of two actions.

- The monitoring of renewable land resources in the Sahel countries

The aim is to develop and demonstrate methodologies using aerospace remote sensing data for

- . the monitoring of rain-fed crops (food resources)
- the monitoring of hydrological resources
- . the monitoring of environment degradation.

These three objectives are closely interrelated; for instance they can all be based on the study of the vegetation dynamics on a regional scale. Consequently a key aspect of the project during the next four years will be the systematic exploitation of NOAA-AVHRR archive data which will permit the construction of a historical data set (1981-1986) of vegetation indices, which will constitute the essential reference for vegetation dynamics analysis. The project involves close contacts with African bodies and frequent field work.

- . the study of the upwelling sea currents of the coast of NW Africa

This preparatory study originated from a request by the Moroccan authorities through DG I for help in the investigation of the upwelling sea current dynamics along their coast, in view of the important consequences for their fishing industry.

¹ WMO : World Meteorological Organisation

The study is of interest to the European fisheries industry as well and as such may be extended in support of the needs and interests of DG XIV.

2.2 Support for the health, hygiene and safety policy (DG V)

Support for DG V will fall into two distinct categories, the first relating to safety at work and the second relating to radioactivity in the environment.

- Safety at work

These activities will include a census of the facilities for respiratory protection, kidney dialysis and the distribution of toxic metals in the body, the publication of monographs on biological surveillance, the use of ECDIN and so on. (This is essentially S/T support for the work on the Committee on Health, Hygiene and Safety)

- Radioactivity in the environment

This work will cover the following topics in an initial phase:

- . the setting up of a data bank on environmental levels of radioactivity,
- . the development of data collection procedures for airborne radioactivity.

It should also be noted that initiatives in this sector are in the offing in collaboration with certain specialised UN agencies, such as the IAEA and the WMO, contacts have been made and will be continued with a view to possible collaboration.

2.3 S/T support to the CAP (Remote Sensing for Agriculture) DG VI-Statistical Office

Statistical information on agriculture can be improved by making use of new techniques for aerospatial remote sensing; more specifically it would speed up certain aspects of the compiling of Community statistics on agriculture, increase efficiency and cut costs. These include harvest inventories, estimation of production (using vegetation indices), indicators for meteorological conditions and data for crop forecasting models.

In order to achieve rapid improvements, the Community is setting up an R&D project aimed at the introduction of remote sensing in the Community statistical system for agriculture (Statistical Office) and thereby support the Common Agricultural Policy

2.4 S/T support to the environment protection policy (DG XI)

The JRC activities in the environmental field are important for the implementation of the Community policy on the environment and major

technological hazards as defined in the 4th Environment Action Programme 1987-91 Activities in support of DG XI include :

- comparison and evaluation of methods for the measurement of atmospheric pollutants by extending the present scope of the JRC Central Laboratory;
- comparison of analytical methods for chemical wastes, development of systems to mitigate chemical accidents,
- support for the implementation of EC directives on freshwater quality . ecotoxicological effects, biological quality of water, drinking water parameters;
- development and implementation, within the framework of the EC directive on "Major Accident Hazards of Certain Industrial Activities", of the Major Accident Reporting Systems (MARS) - a data bank on major accidents, contribution to the harmonisation of risk analysis methodologies and to the definition of emergency planning procedures

2.5 S/T support for the Community Bureau of Reference (DG XII)

The conditioning, storage and distribution to clients of non-nuclear reference materials is an activity in direct support of the Community Bureau of Reference (BCR), these activities will continue in the years to come under a special agreement concluded with the BCR programme.²

2.6 S/T support to the Nuclear Safeguards Directorate (DG XVII)

The JRC support to the Euratom Safeguards Directorate addresses technical problems defined by the Inspectorate for a number of tasks :

- the development, field testing, calibration and maintenance of instruments supplied to the Inspectorate,
- the organisation of in-depth training courses (about 15 per year) for Euratom safeguards inspectors,
- the management of data, including their evaluation, validation and transmission to the central services,

and for two services

- the chemical analysis of samples taken by inspectors in the various parts of the fuel cycle,
- support in health physics, where the JRC provides assistance and training in the field of radiation protection to the inspectors working in nuclear facilities

² See COM(87)444. Draft Council Regulation on the research and development programme in the field of applied metrology and chemical analysis in the European Economic Community (1988-91). (Community Bureau of Reference BCR).

2.7 Support for new energies (DG XVII)

JRC provides a scientific and technical backup for the initiatives of DG XVII in the field of new and renewable energies. The following subjects are, in particular, included in this activity

- support to the Energy Bus Programme,
- laying down standards of performance for solar equipment used in demonstration projects; evaluation of all the monitoring results of the projects,
- setting up of an Information and Analysis Centre concerning the results of the demonstration projects.

More generally, the JRC takes part in the process of scientific reflection on the use of new and renewable energies, a scientific and technical support action in the fields of alternative energy sources and energy saving is in preparation.

2.8 Other JRC support activities

Other activities of the JRC are being streamlined according to the customer/contractor principle to support sectoral policies of the Commission. A number of activities have already been identified :

- IAEA Nuclear Safeguards - technical cooperation (DG I)
- CAP (Wine Monitoring Laboratory) DG VI
- CAP (Integrated action for crop protection) DG VI
- Commission transport policy - DG VII
- Development of European reference methods for industry - DG III
- Regional policy (DG XVI) using aerospace remote sensing
- Directorate-General for Customs Union and Indirect Taxation - DG XXI
- General support (Secretariat General- DG V/DG XI) - cooperation and mutual assistance in the event of disasters

Discussions will therefore continue in future with a view to identifying the JRC activities which lead to regular scientific/technical support for the sectoral policies of the Commission. One area which is likely to be expanded is JRC technical support for the prevention and detection of fraud.

Lastly, there will always be a number of JRC S/T support activities, which will be of a temporary nature

These activities will all be included in the annual schedule of JRC activities.

A special mention should be made of the cooperation with DG XIII and with the Task Force for Small and Medium-sized Enterprises aimed at exploiting the results of JRC research. A major effort will be made from now on to ensure that the technology developed in the JRC is transferred to the outside, especially to small businesses, this will entail making use of the network set up by the SME Task Force.

EVALUATION OF RESEARCH RESULTS

1. In future, JRC activities will fall into a number of distinct categories, one of which is the execution of multiannual specific research programmes under Article 7 of the Euratom Treaty and Article 130 Q2 of the EEC Treaty in support of the implementation of Community policies as laid down by the scientific and technical objectives of the Framework Programme for Scientific Research and Technological Development.
2. For these multiannual specific programmes proposed for the period 1988-91, these will be formal mid-term evaluations in accordance with the principles laid down by the Commission in its Plan of Action of November 1986.³
3. The Commission, after consulting the Board of Governors, will organise the evaluation of all JRC research activities including the specific programmes.
4. An indicative amount of 0.5 MECU has been set aside in the 1988-91 appropriations to cover the costs of the evaluations.
5. The evaluations will have the following terms of reference :
 - a) assessment of the scientific and technical achievements of the programme taking into account its original objectives; quality and practical relevance of the results, and possible spin-offs;
 - b) contribution of the programme to the development of other Community policies and to the social and economic development of the Community in general;
 - c) evaluation of the effectiveness of management and of resource utilisation,
 - d) recommendations for future orientation of the programme, management improvements, exploitation of results, etc.

The results of the evaluations will be published by the Commission.

³ OJ C 14, 20.1.87, p. 5

FINANCIAL STATEMENT

1. Budget heading

Reference: 1988 preliminary draft budget - Article 737

The recent proposal to amend the Financial Regulation will involve sweeping changes to the budget structure.

2. Legal bases

Article 130 Q 2 EEC

Article 7 ECSC

3. Description and justification

Staff

The JRC consists of nine scientific institutes, a Directorate-General in Brussels and two support units in Ispra. For the new JRC, the Commission proposes to maintain the workload of the JRC at its present level corresponding to a staff of 2 260. This staff will be used to carry out the tasks entrusted to the JRC, which over the period 1988-91 will be divided into four categories:

- specific programmes, representing the part of the framework programme to be carried out by the JRC;
- JRC services performed at the request of outside bodies and individuals, including the Euratom supplementary programme for the operation of the HFR reactor;
- JRC scientific and technical support to Commission departments;
- preparatory research work for new activities.

3 1 Specific programmes

The JRC's new specific research programmes for 1988-91 will be directed at three main objectives:

- contributing to the completion of the large internal market,
- the enhancement of safety, prevention and mitigation of accidents,
- the surveillance and protection of the environment.

The completion of the large internal market by 1992 will result in a significant increase in demand for new standards, codes of practice, safety regulations and quality control. This approach is essential in order to fully open up markets, prevent distortions in competition and ensure consumer protection; it will also make a significant contribution to strengthening the competitiveness of European industry in relation to its external competitors.

There is growing concern among the public and in political circles over the enhancement of safety and the prevention and mitigation of accidents; it relates as much to nuclear activities in the aftermath of the Chernobyl accident as to other industrial activities following the accidents at Seveso, Bophal and more recently Basle

This theme contributes to a significant extent to the public acceptability of technological innovation, and is thus an important factor in the development of industrial competitiveness.

The surveillance and protection of the environment is also a response to public concern for a guaranteed improvement in the quality of life in an environment which unfortunately is clearly deteriorating.

The JRC's specific research activities correspond to the subheadings of the Community framework programme set out in Table 1.

3.2 JRC scientific and technical support to Commission departments

The second category covers the scientific support which the JRC gives the Commission departments. A list of work already identified under this category is given in Table 2. This list should be regarded as indicative of the type of tasks that the JRC will be called upon to carry out, but it is far from exhaustive; discussions with potential clients are continuing and it is clear that some will come forward only during the period.

This work of supporting Commission departments may be classified as follows:

- Operations involving a certain continuity generally of a multiannual nature; this category includes for example the remote sensing operation for the Directorate-General for Agriculture and the Statistical Office (SOEC) or the technical support to Euratom Safeguards or to the Directorate-General for the Environment.
- Work of a more ad hoc nature meeting specific temporary needs of the Directorates-General. This will be defined on an annual basis by a users' committee composed of the interested Commission departments.
- The scientific and technical support to Commission departments is work which is in any case necessary for the implementation of the Community policies for which those departments are responsible. The work is awarded to the Centre for its expertise, its neutral and independent judgment and its flexible management of activities owing to the close liaison between the JRC and these other departments. All work given to the JRC will count as an asset for it. Assets will then be cancelled out by equivalent savings in the areas of the budget relating to the policies concerned. In other words, if the work had to be carried out elsewhere, the financial burden on the other sections of the Commission's budget would be the same. The Commission's proposal also results in a more transparent budget presentation.

3.3 JRC services performed at the request of outside bodies and individuals

The third category of JRC activities covers work carried out with external financial resources. This financing could come from:

- a contract with a Member State or group of Member States for the operation of a facility or the execution of research in the form of cooperation projects on themes falling within the general field of application of the specific JRC programmes; participation in Eureka projects should fall into this category;
- the execution of research or provision of services in the framework of an industrial club for which the industrial partners would have to pay an entrance fee and annual dues;
- the execution of research under a specific contract;
- the provision of scientific or technical services against payment;
- the execution of the Euratom supplementary programme for the operation of the HFR reactor.

Other work is envisaged as a spin-off of the JRC expertise acquired during the execution of the specific research programmes.

This work is justified by the need for the expertise acquired by the JRC and its specialized high-technology equipment to be made available to private or public sector clients in return for payment.

It is for the potential client, who in any case pays the cost, to provide specific justification for each project

3 4 JRC preparatory research work

The fourth category of JRC activities is preparatory research for new activities. The Commission endorses the proposals by the Panel of Senior Industrialists that a share of the JRC's turnover should be spent on preparatory research. These funds will be dedicated to increasing the level of excellence of each laboratory in selected scientific fields. They will be used to explore new ideas so as to push back the frontiers of knowledge. The very nature of preparatory research means that its scientific and technical objectives cannot in principle be defined in detail. Its development arises out of discoveries made during "exploration" of an unknown field. Preparatory research, like other similar activities, does not fall within the specific programmes adopted under the framework programme. It will therefore be entered in the Commission's budget.

It has been agreed to build up this new type of activity gradually. It is planned to start in 1988 and expand it in such a way that the mean value over the period 1988-91 attains 7% of the JRC's turnover.

4 Financial implications

4 1 Type of expenditure

- Total JRC staff
- Specific appropriations for the execution of specific research programmes on a multiannual basis.
- Specific appropriations for scientific and technical support to other Commission departments on an annual basis

- Specific appropriations relating to the execution of research work or services under contract for outside bodies (income = expenditure) The amounts will be removed from the budget with the exception of an investment (working capital) fund for work performed at the request of outside bodies and individuals.
- Specific appropriations for the execution on an annual basis of preparatory research not covered by programmes, intended to open up new prospects for the JRC and maintain a high level of scientific excellence.

4 2 Total cost for the period 1988-91

- The expenditure on staff required for the execution of the specific programmes, S/T support to the Commission departments, work at the request of outside bodies and preparatory research amounts to 570.7 million ECU.
- Expenditure on the specific programmes - excluding staff - is 283.3 million ECU;¹ including staff it comes to 690 million ECU.
- Expenditure on activities in support of the Commission's departments is estimated - excluding staff - at 54.3 million ECU; including staff it comes to 120 million ECU.
- The total cost of work performed at the request of outside bodies and individuals is estimated - excluding staff - at 70.3 million ECU; including staff it comes to 118 million ECU.

The amount of the supplementary programme involving two Member States, the Netherlands and the Federal Republic of Germany, for the operation of the HFR reactor is 78 million ECU, including staff;² in addition, irradiation work due to be carried out in the HFR for the JRC specific programmes is estimated at 7 million ECU and on behalf of outside bodies at some 5 million ECU.

Specific appropriations for work performed at the request of outside bodies and individuals carry a token entry in the general budget of the European Communities, except for a working capital fund which does appear in the budget.

- Expenditure for preparatory research is estimated - excluding staff - at 19.4 million ECU; including staff it comes to 70 million ECU.

The total turnover of the JRC for this period is estimated at 998 million ECU.

¹ This total cost includes among other things a shared-cost programme worth 20 million ECU under the reactor safety programme.

² Taking account of contributions in kind from the Netherlands.

4 3 Method of calculation

(a) Staff expenditure

The new JRC will initially maintain the total staff complement of 2 260.

Annual expenditure is estimated on this basis at 132.4 million ECU for 1988, 139 million ECU for 1989, 146 million ECU for 1990 and 153 3 million ECU for 1991. The breakdown of staff expenditure for the four categories of JRC activities is given below:

Specific programmes	406 7
S/T support	65 7
Work for outside bodies	47.7
Preparatory research	50.6

Total	570 7

Total staff expenditure is therefore estimated at 570 7 million ECU.

However, this amount includes substantial funds, approximately 5 million ECU a year, for visiting scientists and fellows, for the exchange of staff with national organizations (public and private) and for staff retraining and redeployment costs (approximately 1 million ECU a year).

All these funds are included in the overall figure for staff costs, making allowance for the impossibility of keeping all posts filled, inevitable in any research centre

(b) Specific expenditure

This expenditure is broken down below for the four categories of JRC activities.

Specific programmes	283 3
S/T support	54 3
Work for outside bodies	70 3
Preparatory research	19.4

Total	427.3

Total specific expenditure is therefore estimated at 427.3 million ECU

4 4 Charging of expenditure and legal basis

(a) Staff

The total appropriations for staff expenditure are to be charged to Chapter 73 in 1988 and part A of the budget in 1989.

(b) Specific programmes

The total cost of JRC specific programmes, including staff, is included in the overall budget for the 1987-91 framework programme: it amounts to 690 million ECU. The corresponding specific appropriations are to be charged to Chapter 73; they will be covered by the Council Decision of (Euratom multiannual programme), and the Council Decision of (EEC multiannual programme)

JRC contribution to the reserve of 417 million ECU

In order to maintain the balances laid down in Annex I to the Decision on the framework programme, there must be a constant ratio between the estimated amounts required for each heading or subheading, pending the decision on the addition of the remaining amount of 417 million ECU; in the Commission's view this decision should in any case be taken before 31 December 1987. Accordingly, the contribution of the JRC specific programmes to this sum of 417 million ECU amounts to 53 million ECU.

For the period 1988-91, it is planned to reserve some 0.5 million ECU for the evaluation of the work carried out under the specific and preparatory research programmes.

(c) Scientific and technical support to Commission departments

Appropriations to support the various Community policies not covered by the framework programme in the field of research and technological development will be entered in the section of the budget relating to research under a specific Chapter (and, pending the revision of the Financial Regulation, under Article B 738). The policies concerned will be specifically mentioned, so that the amounts provided for each of them can be distinguished. These policies will also be mentioned in the comments of the budget chapters so as to identify their contribution to the JRC's work. Specific appropriations for this research will be requested annually via the budget.

(d) JRC activities performed at the request of outside bodies and individuals

(d)(i) Operation of the HFR reactor

The operating expenses of the HFR reactor will be partially covered by a supplementary programme funded by German and Dutch contributions. The item corresponding to operating appropriations will carry a token entry. In the course of the financial year additional appropriations will be made available under this item, to the amount of the revenue to be entered in the statement of revenue of the corresponding section of the general budget. The part equivalent to staff costs will be refunded to the Community budget by means of a procedure to be studied and implemented by the departments concerned.

Other contributions will come from specific programmes (7 million ECU) and work for outside bodies (5 million ECU).

(d)(ii) Other JRC activities for outside bodies and individuals

In future the JRC intends to develop its activities performed at the request of outside bodies and individuals. The Panel of Senior Industrialists requested by the Council to study matters relating to the JRC recommended that in future the JRC budget be financed to a greater extent than at present by remuneration for JRC services performed at the request of outside bodies and individuals.

The budget heading (7382 in 1988) will henceforth carry a token entry, with the exception of a working capital fund.

As soon as reimbursement for JRC work is received, the part equivalent to the staff costs will be refunded to the Community budget by a procedure to be studied and implemented by the departments concerned.

(e) Preparatory research

Appropriations for this research will be requested annually via the budget. They will be charged to Chapter 73.

The multiannual schedule of commitments and payments is given in Table 3.

Notes on the multiannual schedule of commitments and payments

The necessary appropriations are entered in the general budget of the European Communities.

1. The presentation of the financial statement conforms to the structure of the preliminary draft budget for 1988.

- there is a specific budget item for JRC staff expenditure;
- appropriations specific to the various activities are entered in a series of items; a distinction is made between the appropriations intended for the execution of:

specific research programmes adopted by the Council pursuant to Article 7 of the ECSC Treaty and Article 130 Q 2 of the EEC Treaty;

- . the Euratom supplementary programme for the operation of the High Flux Reactor;
- . scientific and technical support to the other Commission departments;
- . preparatory research work for new activities;
- . services performed at the request of outside bodies and individuals.

For the latter type of services, with the exception of some investment expenditure (working capital fund) necessary for securing certain contracts with outside bodies and individuals, the item will carry a token entry. In the course of the financial year additional appropriations will be made available under this item, to the amount of the repayments provided for in the contracts to be concluded with the requesting outside bodies and individuals.

The item relating to the operating appropriations for the HFR supplementary programme will also carry a token entry. In the course of the financial year additional appropriations will be made available under this item as well, to the amount of the revenue to be entered in the statement of revenue in the corresponding section of the general budget

2. With regard to services performed at the request of outside bodies and individuals, the revenue for which additional appropriations are to be made available will include two types of expenditure:

- staff expenditure, for which a repayment will be made under the appropriate heading; and
- specific appropriations, for which additional appropriations will be entered

If necessary, part of these appropriations may be repaid to the working capital fund.

3. The staff complement needed for carrying out all the JRC's tasks will be entered in a table of JRC staff annexed to the budget. As regards staff assigned to work performed at the request of outside bodies and individuals, account should be taken of the need for reserve staff who are not in principle covered by this work but will take part in obtaining it and must be on hand immediately for fulfilling contracts once these have been secured.
4. From 1989 onwards, in accordance with the proposal for the amendment of the Financial Regulation (COM(87) 458 final, 30 September 1987), the budget structure of the research appropriations is to be changed drastically:
 - (a) Staff expenditure will continue to be entered in a specific chapter but this will be contained in part A of the general budget.
 - (b) Administrative operating expenditure (general and administrative services) will also be entered in part A of the general budget, where it will appear under one or more specific headings. This new presentation will involve a radical amendment of the present financial statement, where this type of expenditure is included in all budget headings. Once this type of expenditure has been defined exactly, the JRC will produce a new financial statement modeled on this pattern.
 - (c) The appropriations specific to the various activities will be entered in several articles in the research section of the general budget.

With regard to the latter, a distinction will be made between the appropriations intended for the execution of:

- specific research programmes adopted by the Council pursuant to Article 7 of the ECSC Treaty and Article 130 Q 2 of the EEC Treaty;
- the Euratom supplementary programme for the operation of the High Flux Reactor;
- scientific and technical support to the other Commission departments;
- preparatory research work for new activities;
- services performed at the request of outside bodies and individuals.

For these services, with the exception of some investment expenditure (working capital fund) necessary for securing certain contracts with outside bodies and individuals, the item will carry a token entry. In the course of the financial year additional appropriations will be made available under this item, to the amount of the repayments provided for in the contracts to be concluded with the requesting outside bodies and individuals.

5. With regard to services performed at the request of outside bodies and individuals, the revenue for which additional appropriations are to be made available will include three types of expenditure:

- staff expenditure and
- general administrative support expenditure, for each of which a repayment will be made under the appropriate heading in part A of the general budget;
and
- specific appropriations, for which an entry will be made in the relevant heading of the research section.

If necessary, part of these appropriations may be repaid to the working capital fund.

A mechanism similar to that for services performed at the request of outside bodies and individuals is planned for the HFR supplementary programme.

Table 1

Specific programme	Research area	Framework programme heading/subheading
Radioactivity evaluation and control	Safety, environment	1. Quality of life 1.2 Radiation protection
Protection of the environment	Environment, internal market	1. Quality of life 1.3 Environment
Application of remote-sensing techniques	Environment	1. Quality of life 1.3 Environment
Industrial hazards	Safety, environment, internal market	1. Quality of life 1.3 Environment
Advanced materials	Internal market, safety	3. Modernization of industrial sectors 3.2 Science and technology of advanced materials
Measurements and reference materials	Internal market	3 Modernization of industrial sectors 3.4 Technical standards, measurement methods and reference materials
Reference method for evaluating the reliability of structures	Internal market, safety	3. Modernization of industrial sectors 3.4 Technical standards, measurement methods and reference materials
Reference methods for non-nuclear energies	Internal market	3 Modernization of industrial sectors 3.4 Technical standards, measurement methods and reference materials
Reactor safety	Safety	5. Energy 5.1 Fission: nuclear safety
Management of radioactive waste	Safety, environment	5 Energy 5.1 Fission: nuclear safety
Fissile materials control and management	Safety	5. Energy 5.1 Fission: nuclear safety
Nuclear fuels and actinide research	Safety	5. Energy 5.1 Fission: nuclear safety
Fusion technology and safety	Safety	5. Energy 5.2 Controlled thermonuclear fusion

Table 2

JRC scientific and technical support to the Commission departments

- S/T support to the IAEA (DG I)
 - Nuclear safeguards
 - Technical assistance and cooperation (under discussion)
- S/T support to developing countries (DG I)
 - Remote sensing in the North-West African coastal regions (fishery resources)
- S/T support to industrial policy (DG III)
 - Development of European reference methods (building codes)
- Support to DG V
 - Radiation protection
 - Safety at work
- S/T support to the CAP (DG VI)
 - Integrated crop protection
 - Laboratory for the analysis of food products (wine)
- S/T support to the CAP (DG VI - SOEC)
 - Remote sensing for agriculture
 - . Regional inventories
 - . Vegetation conditions and yield indicators
 - . Yield forecasting models
 - . Fast assessment of areas and of potential yield in Europe
 - . Advanced system of farming information
 - . Associated surveys for sampling
 - . Long-term research
- S/T support to transport policy (DG VII) (p.m.)
- S/T support to developing countries (DG VIII)
 - Remote sensing in the Sahel
- S/T support to environmental protection policy (DG XI)
 - Chemical products
 - Atmospheric pollution
 - Waste
 - Water quality
 - Major accidents
- S/T support to DG XII
 - Community Bureau of References
- S/T support to DG XIII
 - Information and telecommunication technology (p.m.)
- S/T support to DG XIV
 - Remote sensing for fishery resources (p.m.)
- S/T support to regional policy (DG XVI)
 - Remote sensing for regional policy (under discussion)
- S/T support to DG XVIII
 - Nuclear safeguards
 - Energy saving and alternative sources of energy
- S/T support to DG XXI (Customs union)
- General support (Secretariat-General, DG V, DG XI)
 - Support for cooperation and mutual assistance in the event of a disaster
- Other S/T support to the Commission departments
- Cooperation with DG XIII and the SME Task Force
 - Technological transfer and exploitation of the results of JRC research

MULTIANNUAL SCHEDULE OF COMMITMENTS AND PAYMENTS (million ECU)

Art Item	Objectives	COMMITMENTS					PAYMENTS					
		1988	1989	1990	1991	TOTAL	1988	1989	1990	1991	1992	TOTAL
1	Institution-specific staff exp	132.4	139.0	146.0	153.3	570.7	132.4	139.0	146.0	153.3	0	570.7
2.1	Radioactivity eval. & control	.9	0	.0	0	9	.5	4	0	.0	0	9
2.2	Environment											
	a) Envir. protect	5.6	5.7	5.8	6.1	23.2	3.1	5.7	5.9	6.1	2.5	23.2
	b) Remote sensing	3.8	3.8	3.8	3.9	15.3	2.1	3.8	3.8	3.9	1.7	15.3
	c) Indust. hazard	2.0	2.5	2.0	2.2	9.7	1.1	2.5	2.0	2.2	9	9.7
	Total 2.2	11.4	12.0	11.6	12.2	47.2	6.3	12.0	11.6	12.2	5.1	47.2
2.3	Science & techn. adv. materials	7.3	5.0	5.0	5.1	22.4	4.0	5.0	5.0	5.1	3.3	22.4
2.4	Standards, meas methods, ref mats.											
	a) Ref. Methods, non-nucl energy	1.9	5	5	5	3.3	1.0	1.3	.5	5	.0	3.3
	b) Ref. Methods, struct. reliab	2.0	5.9	4.8	4.4	17.1	1.1	5.9	4.8	4.4	9	17.1
	c) Nucl meas & ref. mats	9.0	8.3	8.2	8.3	32.8	4.4	8.3	8.2	8.3	3.6	32.8
	Total 2.4	11.9	14.7	13.5	13.2	53.2	6.5	15.5	13.5	13.2	4.5	53.2
2.5	Fission, nuclear safety											
	a) React safety, incl shrd-cost	17.0	17.8	16.8	15.3	66.9	9.4	17.9	16.8	15.3	7.7	66.9
	b) Radioactive waste managmt.	4.3	4.5	4.1	4.1	17.0	2.4	4.5	4.1	4.1	1.9	17.0
	c) Fiss mats control & manag	4.0	3.3	3.4	3.5	14.2	2.2	3.3	3.4	3.5	1.8	14.2
	d) Nucl fuels & Actin. research	9.2	8.7	8.5	9.5	34.9	5.1	8.7	8.5	8.5	4.1	34.9
	Total 2.5	34.5	34.3	32.8	31.4	133.0	19.0	34.3	32.9	31.4	15.5	133.0
2.6	Controlled thermonucl fusion	9.4	7.8	4.9	4.5	26.6	5.2	7.8	4.9	4.5	4.2	26.6
2	Tot Spec Progs	75.3*	73.8	67.8	66.4	283.3	41.4	75.0	67.8	66.4	32.7	283.3
3.	Support Commiss	10.7	12.9	14.6	16.1	54.3	5.9	12.9	14.6	16.1	4.8	54.3
4.1	HFR (supplementary programme)	12.4	14.5	15.1	14.8	56.8	8.1	14.5	15.1	14.8	4.3	56.8
4.2	Other work ** "outside bodies"	1.9	3.2	3.8	4.6	13.5	1.0	3.2	3.8	4.6	9	13.5
4	Work for outside bodies	14.3	17.7	18.9	19.4	70.3	9.1	17.7	18.9	19.4	5.2	70.3
5	Prepar research	2.3 ***	3.8	5.4	7.9	19.4	1.3	3.8	5.4	7.9	1.0	19.4
	JRC TURNOVER	235.0 ****	247.2	252.7	263.1	998.0	190.1	248.4	252.7	263.1	43.7	998.0

* The amount entered in the 1988 budget is 77.6 million ECU. A transfer of 2.3 million ECU will be made to heading 5 in the course of the financial year (see (***)).

** The amount shown for 1988 does not appear in the budget (or there is just a token entry). The amount of 1.9 million ECU will be collected as revenue from outside bodies or individuals. As for subsequent financial years, the amounts shown comprise general administrative support expenditure and also appropriations intended for establishing a "working capital fund" (to the amount of 5.6 million ECU). These amounts will of course be subsequently "refunded" by the outside bodies or individuals. Any additional revenue in specific appropriations may be paid by outside bodies.

*** The amount shown for 1988 does not appear in the budget. There is a token entry under the relevant heading. The heading receives its funds by transfer from all of the specific programmes (line 2).

**** The amount entered in the preliminary draft budget for 1988 is 220.7 million ECU (235.0 - 1.9 (outside bodies) - 12.4 (HFR)).

COMPETITIVENESS AND EFFECT ON EMPLOYMENT

1 Competitiveness

The basic aim of the re-orientation of the JRC outlined in this proposal is to make it more accessible to European industries, universities and other research institutions; this will be done by gearing the JRC's research programmes to actual needs, increasing the amount of work carried out under contract for industry, and organizing research on the basis of industrial research "clubs".

It is therefore expected that small and medium-sized firms, which are generally less well equipped for research work than larger enterprises, will be able to benefit more directly from the Joint Research Centre's work

Small and medium-sized firms may at present be regarded as deriving benefit directly from the JRC:

- (i) either as users of the scientific results obtained by the JRC or of its specialist installations;
- (ii) or as actual suppliers to the JRC.

2. Direct effect

Small and medium-sized firms are regular users of the JRC, and in particular users of the knowledge which the JRC accumulates, evaluates and disseminates, such as:

- the advanced materials database at Petten;
- the ECDIN database at Ispra, of chemicals likely to have an effect on the environment (this database is run on a commercial basis by an outside firm working on the Commission's behalf).

Small and medium-sized firms also use the JRC's experimental installations, including the solar equipment evaluation facility at Ispra; their work will be further developed with a view to establishing reference methods.

Small and medium-sized firms are also working together with the JRC establishments to develop instruments used in several programmes and in the preparation of new methodologies, including those to do with data transmission and processing (safeguard system, remote sensing techniques). It is interesting that the new disciplines used in the programmes have often been developed in collaboration with the small and medium-sized firms (artificial intelligence being an example).

Futhermore, most projects on the exploitation of JRC research are carried out by small or medium-sized firms. This will continu in future.

Finally, in traditional areas, it is estimated that about a third of the funds earmarked for the general operation of the centres (energy, transport, maintenance, including cleaning of buildings and technical installations, operation of installations and central services, etc.) are spent on contracts with small and medium-sized firms. At the same time, scientific and technical support to programmes such as equipment manufacture, maintenance of instruments, preparation of samples, and

manufacture of objects for irradiation, is provided mainly by small and medium-sized firms near to the Joint Research Centre establishments

3 Indirect effect

Another spin-off of the JRC research results has been the stimulation of the creation of new small and medium-sized firms in high-technology fields, recent examples of which are new remote-sensing firms

4 Future prospects

The reorganization of the JRC into individual institutes will help to improve relations between the JRC and small and medium-sized firms. In view of the greater flexibility and improved ability of these institutes to meet industry's requirements more directly, mainly by establishing direct cooperation with industry, relations between the JRC and small and medium-sized firms can be expected to improve.

The establishment of industrial research clubs and the possibilities of training through research, should allow small and medium-sized firms to take part in JRC research at lower cost.

The work carried out by the JRC under contract with outside bodies - one of the Centre's new types of activity - should attract clients among the small and medium-sized firms. The JRC is currently examining the implications of this and the first indications are that this will strengthen contacts with small and medium-sized firms. Special efforts will be made to conduct work on behalf of small and medium-sized firms, usually through multi-client agreements. In order to carry out this special kind of marketing, use will be made of industrial consultants and the network set up by the SME Task Force.

5 Employment

In addition to the jobs provided by the establishments themselves, it should not be forgotten that the housing of over 2 000 people and their families, and the scientific visitors, fellows and students, etc., the staff of the European schools and local services, have an important social impact extending well beyond the research activities and their supporting services. This gives rise to a highly diversified demand for consumer goods which often reflects a living standard which has risen since the Centre was established, this generally leads to the creation of secure new jobs.

In a broader context, there are examples of the results obtained at the JRC leading to new initiatives either in existing firms or in the creation of new firms. This obviously tends to create new jobs. This trend will continue, it is hoped at an accelerated rate when the Centre is more closely oriented to the needs of European industry.

6 Consultation of representative organizations

The report requested by the Commission from a panel of senior industrialists includes important recommendations for the formulation of this proposal, the report drawn up for Mr L. Granelli, the then research minister, by a special advisory committee composed of Italian experts, the resolution adopted by the European Parliament on 12 December 1986 on the revision of the JRC programme for 1984-87 for 1987, the opinion of the Economic and Social Committee of 27 November 1986 on the said revision, the comments of the JRC Board of Governors on the report by the panel of senior industrialists and finally the contributions of several Member States and the debate in the Council of 28 September 1987, have all contributed to the discussions which resulted in this proposal.