

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(86) 145 final

Brussels, 14 March 1986

FUTURE DEVELOPMENTS FOR THE JOINT RESEARCH CENTRE

DISCUSSION PAPER FOR AN ORIENTATIVE DEBATE

(Communication from the Commission to the Council)

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1. INTRODUCTION - THE COMMUNITY NEED FOR A JOINT RESEARCH CENTRE

At a time when Western Europe is becoming dramatically aware of the importance of common research efforts, and is actively studying new forms of collaboration, selecting the most effective ways to use increasing, but limited, resources, the time has come to re-examine the JRC without pre-conceived ideas beginning with the technological needs of Europe and with the EC rôle in satisfying them.

It is the goal of the European Community to promote industrial competitiveness and economic development preserving the quality of life which its peoples have attained. The protection of the environment and the assurance that new industrial developments occur with a maximum of safety represent both a duty towards the present and future citizens of Europe, and a condition for the acceptance by the people of the new technologies.

The Commission of the European Communities has specific tasks to perform in the achievement of these two goals. The development of European technology requires several coherent measures : firms, research institutes and universities must be encouraged to collaborate beyond the national boundaries, so that a large common market of technology and for technology can be achieved. This is being pursued through several recent initiatives for the promotion of research, development and innovation.

It is a common belief that the above actions are necessary but not sufficient conditions for technological developments. They must be integrated by measures aimed at the realization of a real "large market" as well as at the provision of appropriate funding through imaginative financial engineering. The Commission has initiated actions in both directions.

1985 was characterized by the launching of the Technological Community, by the EUREKA initiative, and by the recognition - in the Unique European Act - of activities for research and technological development as a fully fledged common policy. The Commission has, quite recently, put forward its orientations with a view to the new Framework Programme for research and technological development 1987-1991.

This programme envisages the following seven priority lines of research action :

- resource management (in particular agricultural);
- energy management;
- competitiveness of industry and services (information technologies, telecommunications ...);
- quality of life ("Europe against Cancer", the fight against AIDS, safety, protection of the environment ...);
- science and technology in the service of development;
- scientific and technical potential in Europe;
- general support for the development of science and technology (innovation, scientific networks, automatic translation ...).

Running through all these themes is the thread of norms and standards to ensure that a common European vocabulary exists in discussion, in development, in manufacture, in the market-place and finally in the home of the consumer where both quality and safety are of paramount importance.

In the field of advanced technology, norms and standards are not the results of purely legal arrangements : they rely rather on an increasingly complex basis of scientific knowledge and technical know-how. Public Authorities require an independent source of such knowledge and technical capacities in order to issue rules which, while taking into account the interests of all, are not unduly influenced by any vested interests.

EC Member States have created establishments of undisputed competence and usefulness to carry out this rôle at national level, and such establishments are recognized by industries as well as by authorities and the educated public. Such institutes represent an extremely valuable asset not only for individual countries, but for the Community as a whole, provided that the Member States recognize the need for a common approach to norms and standards, and are willing to accept coordination among them in areas where common norms and standards are needed to achieve a "large European market". However, coordination at Community level can be effective only if supported by an independent technical capacity. Experience has confirmed that, in order to become a credible and neutral agent in the preparation and implementation of common norms and standards, the Commission itself must have at its disposal its own technical competence, especially in critical fields where the treaties or the agreement of Member States confer special responsibilities on the Commission. Moreover, in some fields, the installations required in order to develop the knowledge, skills and technological capacities necessary for the preparation of norms and the issue of standards are quite unique and would be very expensive to reproduce or duplicate.

In the relatively few fields where the JRC has so far been active, the central rôle of the JRC as a competent and neutral reference point has been, and is recognized by industrial firms. For instance, in the field of photovoltaic technology, a reference method developed at the Ispra establishment of the JRC has allowed industrial firms to reach common agreement on conflicting performance measurements which reference to national laboratories had failed to resolve. In a similar way, some years ago the databank on environmental toxicological substances was put to effective use for analysing the effects of the SEVESO catastrophe.

A central rôle requiring specific technical capacities is also needed in some areas of safety. The nuclear field is an obvious case. In this area, the nature and transnational character of the problems, and the particular sensitivity of public opinion render the availability of a central Community facility particularly

desirable, all of which is recognized by the industries involved. At a time when public opinion is strongly impressed by the fall in oil prices, it is important to stress that the Commission, in developing its energy policy, is convinced that the diversification of the energy sources remains a constant objective to be pursued at Community level to keep Europe independent and capable of adapting to rapidly fluctuating supply conditions. The availability and dynamic maintenance of technical competence - which takes a long time to acquire - is a prerequisite for such a capacity.

Nuclear energy is an obvious, increasingly important source of energy; Europe is presently at the frontline of its development of this form of energy; it must continue to remain there under conditions of maximal safety, guaranteed by a common assessment. Nuclear safety is but one area where the Commission performs an indispensable central reference rôle. Other aspects of industrial safety and environmental monitoring in particular are also pursued.

The above considerations show that the Community does indeed need a common research establishment for the performance of two essential tasks : the supply of independent knowledge for the development of common norms and standards for the large market, and the assurance that technological development in sensitive areas occurs under common conditions of safety.

The JRC, which was created for different purposes, has already gone a long way towards assuming the new tasks as recognized by the recent Mid-Term Evaluation Report established by the Scientific Council : the pace of this transformation must, and can be accelerated.

Essential features of this transformation are better integration with national laboratories to which it should supply the Community dimension, and an improved response to the requirements of industry. It is the authoritative opinion of the JRC Scientific Council that the JRC has indeed the capacity to adapt its remarkable human and material resources to new tasks when it receives clear indications to that effect.

2. THE ROLE OF THE JRC IN COMMUNITY STRATEGY FOR RESEARCH AND TECHNOLOGICAL DEVELOPMENT

In the present document, the rôle proposed for the JRC in the implementation of the 1987-1991 Framework Programme will be defined, its corresponding scientific profile outlined, and some of the necessary structural and managerial adaptations indicated.

Set up under the EURATOM Treaty, the Joint Research Centre performed exclusively nuclear research until the end of the 1960's when Community research priorities moved towards conservation of resources, and to socially motivated research such as protection of the environment and consumer protection. Since that time, a succession of four-year programmes have successively strengthened JRC research in Industrial Technologies, Solar Energy, and Environmental Protection whilst efforts in nuclear research have become concentrated on safety and public protection aspects of energy generation with light water and fast reactors, and on safety problems which will accompany the future application of thermonuclear fusion reactions to power production. The JRC is now ready to devote its forces to pre-normative research.

Common standards, common codes of practice and generally agreed methods for test and verifications by measurements ease the free transport of goods and services across national frontiers.

Measurement technologies, standards and data make industrial research and development more productive by making it easier for industrial scientists and engineers to transform general technical principles into new processes and new product technologies. They add to the competitiveness of the industry. Measurement methods, standards and data are crucial to quality assurance and process control, and thereby add to the protection of the consumer.

The setting of norms and levels of tolerance for environmental parameters is a requisite for the protection of the environment and of the health of mankind, and adequate measurement methods can monitor pollution effects and ensure they stay within agreed levels.

Technological processes and the generation of energy by nuclear or other sources can involve the risk of accidents of minor or major scope. Adequate safety levels are defined, but must be constantly surveyed and adapted in line with the progress of technologies in order to ensure the protection of mankind and allow for the acceptance of technologies by our populations.

In this very wide spectrum of applications of standards, norms, common codes of practice and measurement methods, it is the task of appropriate regulatory bodies (Community and national regulatory bodies, national and international standardisation organisations, industrial associations etc.) to set the standards, agree on the codes of practice, define the safety levels and prescribe the measurement methods. These must, however, be based on the most recent advances in scientific and technological knowledge. Standards must be relevant to the latest technological products and not only concern the goods of yesterday. Safety levels must be relevant to the newest technological processes and measurement methods must benefit from recent progress in measurement sciences.

Standards, norms, measurement methods etc. can only muster consensus when they are strongly based on neutral scientific and technological knowledge, and agreed upon independent of one-sided national or economic interests.

There are many outlets for scientific and technological knowledge which ensure the proper basis for the standardisation process in the widest meaning of the term. They stem from research in a wide variety of international, national and industrial laboratories and the Commission disposes of schemes to ensure collaboration and harmonisation. However, more needs to be done in the future and a guarantee of neutrality can be assured by complementary research to enable standards and measurement methods conducted in a common transnational laboratory to supplement work carried out elsewhere.

Thus, as stated in the introduction, research at the "pre-normative" level leading to the setting of norms and standards and common measurement methods needs direct action as one of its components. It accordingly makes a crucial contribution to the European standardisation activity, and in particular to the Community policy in this field.

Through its successive multiannual programmes the JRC has, for several years now, been contributing to the advancement of the measurement sciences, performed research to enable standards, and conducted safety oriented research in the nuclear field ranging from reactor safety research to research into the safety of the nuclear fuel cycle, right down to research on methods for safeguards of fissile materials.

Much JRC research in the thermonuclear fusion field is oriented towards safety issues and the environmental protection research programme is oriented towards assisting the Commission in setting up proper regulations as well as the newer research lines on applications of remote sensing techniques through campaigns with national laboratories which lead to the setting of common codes of practice.

The JRC-Geel establishment conducts the Community Bureau on Nuclear Measurements as required by the EURATOM Treaty; the JRC-Petten research on high temperature materials is oriented towards standards in this important field, and in this connection, at a recent meeting of industrial experts in Petten, the point of view was expressed that the Petten establishment should develop along the lines of a European institute for high temperature materials standards; the JRC-Karlsruhe research on nuclear fuels is safety research oriented, and the JRC-Ispra is the base for the nuclear and the environment protection research. The research is of assistance to national bodies and industry.

At the same time, a varying effort has been devoted to research requested by other Directorates General in support of the Commission's sectorial policy. In these cases the necessity for independence and objectivity has been found to be of importance, and has created a steady clientèle. The quality of the very diverse services rendered in chemistry, physics, engineering and the establishment of data banks for a number of purposes is exemplified by the fact that the customer returns time and again, and that work undertaken is limited not by lack of requests, but by lack of resources.

A few examples of studies and experiments, requiring a strictly impartial approach, executed for other Directorates General are, for DG III (Internal Market and Industrial Affairs) : JRC participated, as a "neutral" Commission Laboratory, with various International Standards Organisation Working groups, on elaborative work concerning a directive on fertilisers. In another study, scientific support was requested on technical problems related to the biodegradability of surfactants with a view to a future regulation on the matter; for DG V (Employment, Social Affairs and Education) and DG XI : the determination of the burden of lead in human blood resulting from the use of lead as an anti-knock agent in petrol. A lead isotope was added by distributors over a region of Piedmont in Northern Italy, and the percentage of the isotope compared to the total lead content in blood samples : some 25% was found; for DG VI (Agriculture) : the development of an analytical method to detect the fraudulent addition of substances to milk products was undertaken, and a method of aerial survey to check olive tree cultivation in Member States was developed; DG XI (Environment, Consumer Protection and Nuclear Safety) entrusted the Centre with a European inventory of existing commercial chemical substances in support of Council Directive 79/831/EEC, and with the setting up of a major-accident data bank in line with the "SEVESO Directive". (This data bank is also consulted by DG V.); for DG XVII (Energy) : apart from the JRC safeguards action which falls under the "Nuclear Fission" Action Programme, the actions include a very considerable analytical support provided on a permanent basis to the Nuclear Inspectorate.

In conclusion, the main rôle of the Joint Research Centre is to produce such knowledge as is necessary for the development of norms and standards, in particular in the fields of safety and the environment as well as in selected industrial areas.

Thus the Joint Research Centre is entrusted with a central rôle in Community research strategy based on activities arising from matters of public responsibility extending across the borders of the Community's Member States.

However, in order to maximize the use of its resources, the JRC should be allowed to undertake actions outside its central rôle on the condition that such actions should only be awarded to the JRC as a result of a competition with other laboratories.

The JRC is capable of fulfilling this rôle. This has been confirmed by an assessment recently made by eight groups of independent experts and by the Mid-Term Evaluation by the newly appointed Scientific Council whose first task this was.

These examinations have shown that the Joint Research Centre, in general, possesses : a competent and well motivated staff and adequate and up-to-date equipment. They have demonstrated that the quality of its work corresponds to the tasks assigned to the Centre, and that it is able to respond successfully to changing orientations set by the Community, as has been witnessed over the past decade when the Centre has gradually gone from exclusively nuclear research into the non-nuclear fields.

Thus the JRC is a research tool well equipped to work on providing the information needed to establish norms and standards with recognized experience in research on protection of the environment and on the safety of technological systems.

The ways and means exist. A detailed research programme proposal can be elaborated at a later stage to harness this valuable instrument to the European Framework Programme.

3. PRESENT STATUS AND PROFILE OF THE JRC

3.1 The current JRC Programme was decided by the Council (1) on 22 December 1983 for the four-year period 1984-1987, with an expenditure commitment of 700 mio ECU including expenditure for a staff complement of 2,260, on the basis of a Commission estimate expressed in 1983 value of the monetary unit.

As anticipated, the Council decision has been supplemented by a series of other decisions on :

- the regulations (2) for termination of service measures to permit the introduction of new skills and a reduction of the average age of staff;
- the implementation (3) of a Tritium Handling Laboratory in Ispra and the transfer of the 12.5 mio ECU set aside for European research activities of particular significance to the JRC Fusion Technology and Safety Programme;
- the establishment of the JRC Board of Governors (4) and of the JRC Scientific Council (5).

The JRC Board of Governors - chaired by Sir John Kendrew, Nobel Prize Winner in Chemistry, Master of St. John's College, Oxford - and the JRC Scientific Council - chaired by Dr. Léon Van Hove, former Director General of CERN, Geneva - came into operation respectively in late 1984 and early 1985.

(1) O.J. L 3/22, 5.1.84

(2) O.J. L 162/1, 21.6.85

(3) O.J. L 210/28, 7.8.85

(4) O.J. L 177/23, 4.7.84

(5) O.J. L 177/29, 4.7.84

As stipulated by the Council decision on the 1984-1987 Programme, the Commission has provided the Council and the Parliament with the execution report for 1984 (1). The execution report for 1985 has been approved by the Board of Governors and is available for distribution.

In 1985, following recommendations by the Board of Governors, the Commission decided on a minor modification in the project structure for the Environmental Protection Programme, as well as on the incorporation of a shared cost action in the Reactor Safety Programme. The latter resulted from the conclusions of the Council (Research) meeting of 19 December 1984. The shared cost action, estimated at 11 mio ECU over three years, is being executed without changing the approved level of resources for the Reactor Safety Programme. The intention is to improve the liaison between JRC research and research in national laboratories.

Since their inception, the Scientific Council and the Board of Governors have closely followed the execution of the current JRC Programme and have been engaged in discussions on the future rôle for the JRC in the context of Community research and technological developments, and on new orientations for JRC research.

The close scrutiny by the Scientific Council of the JRC research activities has been one of the elements for its evaluations which are now available in its Mid-Term Evaluation Report. Another element has been the work and conclusions of the eight sectorial evaluation panels composed of independent experts who, in 1985, covered the whole range of JRC programmes in the framework of the Commission research evaluation activities. These reports have been, or will be published by the Commission.

(1) COM (85) 626 final

The Mid-Term Evaluation Report fulfills the requirement in the Council decision on the 1984-1987 Programme to present a critical analysis of the programmes launched by the JRC which is performed by independent experts prior to the proposal for a new programme for the JRC. The report is being submitted to the Council and the Parliament.

The appraisal of the JRC, and the many forward looking recommendations in the report, constitute an important element for the Community institutions with regard to the shaping of the future of the JRC.

In the present document, the Commission responds to these recommendations. They will give rise to reorientations of the work and the methods for research execution.

On 22 November 1985, the Board of Governors issued a statement in which it wished to bring to the attention of the Council the evolution of the budgets under the present Multiannual Programme and its forecast that funds remaining for the last year of the programme - 1987 - would be insufficient.

At the same time, it stated that a need had been identified to reorientate the research carried out by the JRC to conform more closely with changing policies in research in the European Community. The Board of Governors therefore proposes to bring article 3 of the Council decision on the present programme into force and thereby cause either a programme revision for 1987 or the initiation of a new Multiannual Programme to begin on 1 January 1987.

These issues were discussed in the Council (Research) on 10 December 1985. In recognition of the aggravated financial situation within the Community since the approval of the present JRC Programme, the Commission announced an economy plan for 1986 and 1987. This is to be of the order of 10 mio ECU for each of the two years : in 1986 by means of savings on the approved budget, and in 1987 by proposing a reduced budget. The economy plan, which had to

be drawn up in a very short time, has been agreed with the Board of Governors at its meeting on 24-25 February 1986, for immediate implementation in 1986 is outlined in annex 1. It will lead to delays in, or cancellation of certain activities in the current programme. However, the Commission regrets that, during these two years, this will necessarily imply delays and reductions in areas selected as being in the mainstream of future JRC research.

As stated above, article 3 of the current programme decision provides for a choice to be made, during the third year of the programme, between a revision of the programme, or the start of a new programme at the beginning of the fourth year. This choice has no bearing on the overall financial level of that year, be it the last one of the old programme or the first one of the new programme.

However, at the Council (Research) meeting of 10 December 1985, the Commission also stated its intention to propose, in 1986, a new multiannual programme for the JRC to begin on 1 January 1987. The Commission can now confirm this intention, namely for the following reasons :

- at present, a need has been identified for direct action research in the context of the overall Community strategy for research and technological developments, and thereby a new forward looking rôle for the JRC.
- the new Framework Programme is planned for 1987-1991, and the planning for the JRC Programme should cover the same five-year period to coincide with this.
- the changes necessary to the on-going work at the JRC should, as recommended by the Scientific Council, be performed bearing in mind the medium-term objectives. This calls for a rolling programme approach, where the last year of the current programme and the overlapping first year of the new programme form the transition.

The new orientations for the JRC, and the measures to be taken to allow the JRC to respond to its new rôle, are described below.

- 3.2 The Commission, in conjunction with the Scientific Council and the Board of Governors, has identified general orientations for the new Multiannual Programme which derive from the recognized needs for direct action research in the new strategy for Community research and technological developments.

Taking the 1987-1991 Framework Programme as a reference, the future activities of the JRC would represent a contribution of pre-normative research to the following Objectives and Actions :

Competitiveness of industry and services

- materials science and technology
- reference materials and methods

Quality of Life

- safety
- environment and climatology

Management of Energy

- fusion
- nuclear fission
- fossil, new and renewable sources and rational use of energy

and, moreover, it is planned to continue the complementary programme Exploitation of the HFR reactor at Petten and to perform tasks for other Commission services as requested.

With strict adherence to the new rôle of the JRC, and bearing in mind the changing needs for the implementation of the objectives of the Framework Programme as well as a change of balance between the nuclear and non-nuclear activities to the advantage of the latter, there are substantial changes envisaged for the new JRC Programme in comparison with the present programme.

Generally speaking, the efforts will increase in areas related to competitiveness of industry and services, as well as in the actions dealing with the quality of life. On the contrary, a significant decrease will characterize the actions related to the management of energy.

The work on nuclear reactors - the largest of the present programmes - will be significantly curtailed, and the work on the energy management of the habitat will be stopped.

The increase in work under the heading competitiveness of industry and services will be emphasized by the formulation of a programme on advanced materials metrology and safety at the Petten establishment, together with a component from the Ispra establishment, concentrating structural mechanics activities towards safety research in non-nuclear fields. A reference measurements and materials programme at the Geel establishment will be required for the continuing need for work on nuclear data and reference materials, but with further emphasis on work for requirements from the thermonuclear fusion field, and with a component of work in the non-nuclear application area using similar methods as in the nuclear field. Consultation with industry for shaping these programmes is being developed at various levels ranging from joint meetings between the JRC Scientific Council and the Industrial Research and Development Advisory Committee (IRDAC) to seminars and visits to JRC establishments by industrial research managers.

The increase in the work for the quality of life objective will find its basis mainly in the present activities for protection of the environment, in the use of remote sensing data for the environment and in the industrial hazards area, but with stronger emphasis on research enabling the setting of norms and standards and common codes of practice. This is research conducted in the Ispra establishment, benefiting from the specialised laboratories and installations which have been built there for this purpose.

The contribution to the overall European Fusion Programme performed chiefly in the Ispra establishment should remain at the same level as at present. The research will, however, be more oriented towards safety issues and this is also the purpose of the new Tritium Handling Laboratory to be completed and put into operation during the programme period.

In the field of nuclear fission, there are several projects in the Ispra establishment which will be terminated such as the projects on liquid metals thermohydraulics, light water reactor structural reliability, fast breeder reactor materials properties and structural behaviour.

There remains, however, a continuing need for both direct action research and associated shared cost action research in the field of reactor safety to be performed in the JRC - mainly Ispra - in conjunction with national research activities and in response to the requirements of industry.

The same applies to research on safety of the nuclear fuel cycle - ranging from radioactive waste management research (Ispra and Karlsruhe), nuclear fuels and actinides (Karlsruhe) and safeguards for fissile materials (Ispra and Karlsruhe). For this research, the two establishments involved will have at their disposal unique installations of which some newer ones in Ispra - such as the PERLA installation for safeguards research, and the PETRA installation for waste management research - are about to come into operation. For the latter, detailed research planning is at present under consideration with national experts.

The action related to new and renewable energies will be concentrated in line with the norms and standards brief, and the habitat project will be terminated. This is research undertaken in the Ispra establishment, which, for testing and reference purposes, disposes of a unique installation already in service for the benefit of European industries and serves in conjunction with other Community programmes in this area.

In line with the federating rôle of the JRC and to encourage a wider use of its assets, as well as to stimulate collaboration with national research and industries, it is planned to launch concerted type actions in the materials metrology and safety areas, and shared cost actions in reactor safety, application of remote sensing techniques and safeguards for fissile materials areas as part of the JRC Programme 1987-1991. For the same purpose the JRC will continue its involvement in COST activities related to materials and environment and its endeavours to define its Community rôle within the EUROTRAC project within the EUREKA programme, and will remain available for similar participations in the future.

An outline of this programme indicating the balances between the various components, and showing a comparison with the present programme is provided in annex 2.

Part of the rôle of the JRC is a considerable amount of work concerned with data - collection of data, evaluation of data, storage of data, providing access to data. This is found in the environmental protection programme in the ECDIN data bank which, by means of a service bureau arrangement, has a large number of users from industry, national administrations, research organisations etc. This is equally to be found in the high temperature materials data bank to which there is also wide access. The reliability data banks under the reactor safety programme are operated under schemes with data suppliers and users, and the new data bank on major industrial accidents is being built up in the industrial hazards programme as a service to the Community implementation of the "SEVESO Directive". As noted by the Scientific Council, there are special problems connected with these data bases such as confidentiality of data and resources, and proper arrangements for their continuing operation as a public service. Some of these problems have already been solved in conjunction with the overall Community policy on the information market and other relevant sectorial policies. A possible solution

to remaining problems will be outlined in the forthcoming formal proposal for the JRC Programme 1987-1991. The same applies to problems concerned with the dissemination and maintenance of computer codes, and in general, the problems concerned with the valorisation and putting into use of the research results.

Several, and, in some cases, new methods must be found for the transfer of know-how between the JRC and national research bodies and industries. This also calls for increased attention to be drawn to arrangements such as the Ispra Courses and Petten meeting point schemes where people from different environments are brought together for deeper discussions of items of mutual interest. These arrangements also form an outlet whereby the JRC research results can reach wider circles, even, in some cases, to the benefit of developing countries.

The programme orientations, as outlined, have already been the subject of more detailed discussions in the relevant sectorial advisory committees : Advisory Committees on Management and Coordination, Fusion Programme Consultative Committee and the ACPM HFR Reactor Petten. These bodies have issued opinions forming a further element for the programme preparations. An initial orientative debate on the nuclear part of the new JRC Programme has recently taken place in the EURATOM Scientific and Technical Committee. There are still a number of issues to be considered further in expert forums and with users of the planned research, but a consensus on the next JRC Programme is gradually being arrived at along the lines of the plan given here.

4. RESOURCE, STRUCTURE AND MANAGEMENT EVOLUTION

- 4.1 The resource level of the JRC today, as defined by the Council decision on the present programme, represents about 30% of the total budgetary resources of Community programmes falling under the first Framework Programme 1984-1987 for research, development and demonstration activities.

In discussions on future programme modules with advisory bodies, and through recommendations from the evaluation panels, contacts with national experts, industry representatives etc., the Commission has been encouraged to make proposals - on scientific and technical grounds - which would lead, if they were all taken up, to an expansion of the Centre's resource level for the next programme in comparison with that of the present programme.

Its guideline for the reflections has, however, been that the desired increases in some programme areas must be balanced by comparable decreases and concentrations in other areas, while an optimal use of the existing competences and scientific/technical installations is pursued.

In some cases, this will lead to the definition of programmes whose execution will be entrusted to more than one establishment. This will be the case with the proposed new programme on Materials and Structures (Petten and Ispra), and with an increased component from Karlsruhe to the programme on Radioactive Waste Management based in Ispra.

The assessment of priority needs for direct action research, and the guidelines on resource balances outlined here, lead to a proposal for maintaining the resources for the JRC on the same level in real terms as those of the present programme, by making a choice amongst the many proposals considered for projects and programmes.

With reference to the Commission's future orientations for the Framework Programme in 1987-1991, the share of the JRC, under the above hypothesis, would amount to roughly 15%.

Within this level of resources, it is intended to make use of the full spectrum of Community research instruments (concerted actions, shared-cost actions) in appropriate cases in order to consolidate the rôle of the JRC in the context of Community research, and to foster closer collaboration with national laboratories and industries.

The infrastructure of the JRC establishments and their specialised laboratories, equipment and scientific-technical facilities represent a large capital investment. In connection with the reflections on the next JRC Programme, the Commission has also performed a review of these assets. There are some facilities in need of upgrading and renewal in view of the orientations for the new programme, and it will be necessary to gain use of new facilities either by securing access to installations elsewhere, or, in very few cases, by proposing new experimental facilities on the sites of the JRC.

There are also installations whose useful life may come to an end during the five-year period of the new programme and which will then be closed. However, as the evaluation exercise has shown, the JRC in general disposes of modern and up-to-date equipment and facilities, and is therefore well placed to assume the tasks for its future programme.

It is not the Commission's intention to include as part of the Multiannual Programme proposal a major European scientific-technical installation representing a large capital investment. Nevertheless, the Commission wishes to offer this option as a future possibility.

4.2 The new rôle of the JRC and the planned changes in the research orientations will also require a number of changes to the present methods of management. The chief measures to be taken are the following :

- at all levels, the DG XII-JRC will strengthen its links with Directorates General responsible for other sectorial policies at the level of programme conception, and with due attention to requests for specific studies to be executed as "support to other Directorates General".

- within DG XII/JRC, an integration of the management of the JRC programmes with other Community research programmes by attributing the overall responsibility to the Director General of the JRC - who is also Deputy Director General of DG XII - in those areas where the JRC efforts carry major weight. In this respect the following areas are presently under consideration : nuclear fission, environment, norms and standards including the Community Bureau of Reference (BCR) Programme.

- change in the internal research management system to cater for progressive development towards the agreed objectives with annual assessment of results and adjustment to needs identified by the Commission and from contacts with national research efforts and industries.

- change in the internal structure at the largest of the JRC establishments (the Ispra establishment) for adaptation to new objectives in research and assignment of more overall responsibilities to the major units of the establishment.

The chief measures envisaged to improve the contacts with national research bodies and industry are the following :

- common management as described above for some areas of all instruments of Community intervention - direct action, shared-cost action, concerted action etc. thus benefiting from the contacts established under the latter actions for the necessary cross fertilisation with the direct action component.

- introduction of a shared-cost action or concerted action component for some JRC programmes where these types of actions are not yet in existence (e.g. research on industrial safety, remote sensing and safeguards).

- improved schemes for putting the results of JRC research into effective use, thus also causing greater awareness and interest among the potential users.

- improved staff mobility and increased flow of visiting scientists and younger research fellows for facilitating an effective transfer of know-how between national centres, industry and the JRC.

- increased activity for meeting point and course arrangements to allow for direct contact and discussion between representatives of national centres, industry and the JRC.

4.3 A vital matter related to the considerations on the future JRC Programme and its adaptation to new tasks is staff management.

The evaluation reports contain several favourable references to the competences of the scientific-technical staff, and it is due to these competences and the flexibility of the staff that the Centre, as stated in the Mid-Term Evaluation Report, has been able to respond successfully to new tasks assigned by the Community over the last decade.

The "termination of service" measures as decided by the Council in 1985 will, moreover, lead to improved alignment of scientific competences to present and future programme requirements. They will also lead to a reduction of the average age of staff. Recruitment of new temporary agents will take place at a controlled rate due to the savings measures for 1986 and 1987, and also to ensure optimal use of the vacant posts for the new programme orientations. A recent summary survey has shown that in 30-40% of the cases, it is necessary to recruit for the same post in order to ensure continuity of operations and of the programme execution. More than half of the 120 posts are thus available to the profit of new programmes in the four establishments.

The JRC has, for many years, filled vacant posts with temporary agents only in cases of recruitment from outside the Commission. At present, half of the staff complement is filled by officials, and the other half by temporary agents. Of the latter, the agents in the scientific/technical category at university trained or higher technician level have contracts of limited duration (up to five

years), which are renewable. These temporary S/T agents at the above-mentioned levels account for 10% of the total staff complement and for 20% of the total S/T staff. The percentages will increase following the departure of 120 officials in the S/T staff and new recruitments of staff on temporary contracts.

Following a proposal from the JRC Board of Governors, the Commission is now studying ways of securing the recruitment for a certain number of posts of staff with a guaranteed "return ticket" to their national establishment. This should lead to increased staff mobility and be one of the measures to improve contacts between the national centres and the JRC.

The need for young scientists and thereby new ideas and inspiration is, however, not only a question of renewal of staff or training schemes for the existing staff. The Centre is successfully using its budget possibilities for scientific visitors and younger fellows under the recently reestablished scheme. At the present time there are approximately 100 visitors and fellows in the establishments. The further opening of the JRC research to national laboratories in line with the new programme orientations will, increase the flow of fellows and visitors, and this has also been strongly recommended by the JRC Scientific Council. The Commission will, in the future, set aside a larger share of the JRC budget for this purpose which represents a proper, if modest, contribution to the action.

5. CONCLUSION

In the light of the discussion on the Framework Programme, the Council is invited to examine the orientations for the future JRC research programme, its rôle in Community research strategy and the relative balance of the various activities.

Based on this discussion, the Commission will submit to the Council a proposal for a five-year JRC programme starting on January 1, 1987. This proposal will be put forward in coordination with that of the 1987-1991 Framework Programme for the scientific and technical activities of the Community.

SAVINGS TO BE ACHIEVED IN 1986 AND 1987

1. According to the conclusions reached by the JRC Board of Governors at its meeting of 24-25 February 1986, the 10 MECUS savings to be achieved in 1986 in the execution of the approved budget will be distributed as indicated in § 2 below, and the savings to be achieved in 1987 by proposing a budget reduced by 10 MECUS, with respect to earlier predictions, will be distributed as indicated in § 3 below.

2. SAVINGS TO BE ACHIEVED IN 1986

	Budget MECU	Economies MECU	Budget after Economies MECU
RAP Industrial Technologies	3.7	0.6	3.1
RAP Fusion	4.5	-	4.5
RAP Fission	17.1	2.4	14.7
RAP Non-nuclear energies	1.7	0.3	1.4
RAP Environment	6.1	1.9	4.2
HFR Reactor	12.6	1.0	11.6
General Administration and Infrastructure	30.3	1.8	28.5
Scientific and technical support functions	13.2	1.0	12.2
TOTAL specific credits	89.2	9.0	80.2

To these 9 MECUS savings on specific credits, will be added savings to an amount of 1 MECU achieved by adjusting the dates of recruitment in 1986 for replacement of those officials who will depart as a result of the termination of service scheme (1).

Specific credits :	9 MECUS
Salaries :	1 MECUS

Total savings in 1986 :	10 MECUS

(1) O.J. L 162/1, 21.6.85

3. SAVINGS TO BE ACHIEVED IN 1987

	Budget MECU	Economies MECU	Budget after Economies MECU
RAP Industrial Technologies	4.9	0.9	4.0
RAP Fusion	4.7	1.0	3.7
RAP Fission	12.0	1.8	10.2
RAP Non-nuclear energies	1.2	-	1.2
RAP Environment	5.3	0.4	4.9
HFR Reactor	12.6	1.0	11.6
General Administration and Infrastructure	30.3	1.3	29.0
Scientific and technical support functions	13.2	0.8	12.4
Social investment	0.8	0.8	-
TOTAL specific credits	85.0	8.0	77.0

To these 8 MECUS savings on specific credits, will be added savings to an amount of 2 MECUS achieved by adjusting the dates of recruitment in 1987 for replacement of those officials who will depart as a result of the termination of service scheme. (1)

Specific credits :	8 MECUS
Salaries :	2 MECUS

Total savings in 1987 :	10 MECUS
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(1) O.J. L 162/1, 21.6.85

ORIENTATIVE EVOLUTION OF THE 1987-91 - J.R.C. PROGRAMME.

	APPROPRIATIONS 1984-1987 (a)		1987 - 1991 %
	(MIOECUs, 1983 value)	%	
<u>INDUSTRIAL TECHNOLOGIES</u>	92	13.1	~20
- Reference measurements and materials	64	9.1	- level and repartition subject to ongoing assessments
- Materials & structures : reliability & standards	28(b)	4.0	
<u>FUSION</u>	59	8.4	8.4 (d)
- Fusion safety technology	59	8.4	
<u>FISSION</u>	352	50.3	~40
- Reactor safety	192	27.5(c)	- major reduction on reactor safety
- Management of radioactive waste	49	7.0	
- Safeguarding and mgt of fissile materials	45	6.4	- minor variations in fuel-cycle related programmes
- Nuclear fuels and actinides research	66	9.4	
<u>NON-NUCLEAR ENERGIES</u>	39	5.6	~5
- Reference methods for N-NE systems	39	5.6	
<u>ENVIRONMENT</u>	99	14.2	~20
- Environmental protection	49	7.0	- increased effort in protection of the environment and remote sensing
- Applic. of remote-sensing techniques	29	4.1	
- Industrial hazards	21	3.1	
<u>EXPLOITATION OF HFR REACTOR</u> (complementary programme)	59	8.4	8.4 (d)
TOTAL	700	100.0	

(a) Council decisions of December 22nd, 1983 and July 25th, 1985

(b) High Temperature Materials programme

(c) including shared-cost actions

(d) the apparent precision indicates, at this stage, a constant level of activity