

II

(Preparatory Acts)

COMMISSION

Proposal for a Council Regulation concerning the European strategic programme for research and development in information technologies (ESPRIT)*COM(87) 313 final**(Submitted by the Commission to the Council on 29 July 1987)**(87/C 283/05)*

THE COUNCIL OF THE EUROPEAN COMMUNITIES;

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

Having regard to the proposal from the Commission,

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

In cooperation with the European Parliament,

Whereas by Decision 84/130/EEC ⁽¹⁾ the first phase of the European strategic programme for research and development in information technologies (ESPRIT) was adopted by the Council on 28 February 1984;

Whereas the framework programme of Community activities in the field of research and technological development (1987 to 1991) was adopted by Council Decision 0000/000/EEC ⁽¹⁾;

Whereas the ESPRIT workprogrammes periodically established in close consultation with the Information Technology (IT) industry, industrial users and science have proved to be an efficient means of programme management;

Whereas the Commission set up an independent high-level body, known as the ESPRIT Review Board, to assess the progress of the Programme;

Whereas the ESPRIT Review Board concluded that the Programme has been successfully established and is well on its way to meeting its original objectives, is progressing faster than initially expected, has initiated trans-European cooperation at all levels especially where small and medium-sized companies are concerned, has

enabled more ambitious research projects and has accelerated the execution of these projects ⁽²⁾;

Whereas the ESPRIT Review Board recommended that for the future development of ESPRIT emphasis should continue to be on precompetitive research and development, the research areas be consolidated and restructured and particular attention paid to technology integration projects;

Whereas in a broad consultation process with a large number of representatives from industry and science the future technical scope of the programme has been defined;

Whereas a continuous need exists to ensure systematic coordination between ESPRIT and national programmes in the information technology sector;

Whereas this programme meets the absolute need for the constitution or consolidation of a specifically European industrial potential in the technologies concerned; whereas its primary participants must therefore be the undertakings, universities and research centres in the Community which are best suited to attain these objectives;

Whereas small and medium-sized companies should be encouraged to maintain a high level of participation in the programme;

Whereas adequate dissemination of, and access to results of projects of Community interest is essential to the pursuit of the aims of the Community and in particular to the needs of small and medium-sized companies;

Whereas there exists a need for periodic assessment of the Programme;

Whereas it is necessary for the execution of the Programme that the Commission be assisted by a committee;

⁽¹⁾ OJ No L 67, 9. 3. 1984, p. 54.

⁽²⁾ COM(85) 616, Brussels, 19. 11. 1985.

Whereas it is in the Community's interest to consolidate the scientific and financial basis of European research by means of the involvement to a greater extent of participants from the EFTA countries in certain Community programmes and, particularly, in programmes involving cooperation in research and development of information technology;

Whereas the implementation of actions in basic research providing long term prospects as well as concerted actions in the COST framework are essential elements to complement industrially-oriented R & D projects;

Whereas the Council, in its resolution of 8 April 1986 ⁽¹⁾, has re-emphasized its commitment to the ESPRIT Programme and requested the Commission to ensure, in its implementation of the programme that, in scope and flexibility, the programme continues to provide an effective response to the ever-increasing challenge in the IT field;

Whereas the Scientific and Technical Research Committee (CREST) has expressed its opinion,

HAS ADOPTED THIS REGULATION:

Article 1

1. A second phase of the ESPRIT Programme of research and development for the European Economic Community, hereinafter referred to as 'the programme', is hereby adopted for a period ending on 31 December 1992. The technical scope of the programme is described in Annex. I.

2. The programme shall comprise pre-competitive research and development projects (hereinafter referred to as 'the projects'), actions in basic research (hereinafter referred to as 'the actions') and accompanying measures.

Article 2

1. The detailed objectives and the type of projects to be undertaken as well as the corresponding financial plans shall be set out in an annual work programme to be adopted in accordance with the procedure laid down in Article 7. Any updates which may be required during the year under consideration shall be adopted in accordance with the same procedure.

2. The evaluation of the projects and actions which are submitted shall be undertaken by the Commission having due regard to the general objectives of the programme and of the annual work programme. With regard to projects requiring R & D efforts exceeding 100 man-years, the eligibility of these projects shall be decided in accordance with the procedure laid down in Article 7. With regard to the other projects and the actions, the results of their evaluation shall be brought to the attention of the Committee referred to in Article 6.

3. The projects shall be carried out by means of contracts, to be concluded by the Commission with companies, including small and medium-sized undertakings, universities and other bodies established in the Community.

The proposals for projects shall as a rule be submitted by the interested parties in reply to an open invitation published in the *Official Journal of the European Communities*. The projects must normally involve the participation of at least two independent industrial partners not established in the same Member State. Each contractor will be expected to bring a significant contribution to the project. The contractors shall be expected to bear a substantial proportion of the costs, 50 % of which shall normally be borne by the Community.

4. The actions shall be carried out by means of contracts to be concluded by the Commission with universities, research institutions or undertakings established within the Community. The proposals for actions shall as a rule be submitted by the interested parties in reply to an open invitation published in the *Official Journal of the European Communities*. The actions must, normally, involve the participation of at least two universities or research institutions not established in the same Member State.

The Community may bear up to 100 % of the costs of the actions.

5. In exceptional cases where the call for proposals has not resulted in a satisfactory response, or in cases of urgency, or where a call for proposals is not the most appropriate procedure on grounds of cost and efficiency, it may be decided, in accordance with the procedure laid down in Article 7, to depart from the general provisions set out in paragraphs 3 and 4, viz.

— the public call for proposals,

— the participation in the projects of at least two industrial partners not established in the same Member State,

— the participation in the actions of at least two universities or research institutes not established in the same Member State.

6. Contracts for the execution of projects and actions which conform to the rules laid down in paragraphs 3 and 4 may include companies, universities and other bodies established in one of the non-Member States referred to in Annex II. That Annex may be changed by the Council, acting by qualified majority, on the basis of a proposal submitted by the Commission.

7. The accompanying measures, in particular those referred to in Annex I(C), aim specifically at providing an adequate communications infrastructure, access to project results and the coordination of research and development activities carried out under the programmes of the Community and of the Member States.

⁽¹⁾ OJ No C 102, 29. 4. 1986, p. 1.

Article 3

The Commission is hereby authorized to conclude, in accordance with Article 130 N of the Treaty, agreements with non-Member States participating in European cooperation in the field of scientific and technological research (COST) with a view to ensuring concerted action between the Community activities relating to the collaboration in actions in basic research and accompanying measures referred to in Annex I and the relevant programmes of such States.

Article 4

The Community shall contribute to the performance of the programme within the limits of the appropriations entered to this end in the budget of the European Communities.

The overall amount of the appropriations estimated to be necessary for the Community's contribution to the projects, actions and accompanying measures under the programme shall be 1 600 million ECU. The amounts include expenditure on staff, whose cost shall not exceed 4,5 % of the Community contribution.

Up to a maximum of 25 % of the Community's total contribution to new projects launched under this programme may for the first year be allocated to new projects which fall below the threshold referred to in Article 2 (2). If the call for proposals has not resulted in a satisfactory response this percentage figure may be changed in accordance with the procedure laid down in Article 7.

Article 5

The Commission shall ensure that the programme is properly performed and, to this end, shall establish the appropriate measures and infrastructures, without prejudice to the powers provided for in Articles 2, 3 and 4.

Article 6

1. The Commission shall be assisted by a committee, consisting of two representatives of each Member State, and chaired by a representative of the Commission, hereinafter referred to as 'the committee'.

Members of the committee may be assisted by experts or advisers depending on the nature of the issue under consideration.

The proceedings of the committee shall be confidential.

The committee shall adopt its own rules of procedure.

Secretarial services for the committee shall be provided by the Commission.

2. The Commission may consult the committee on any matter falling within the scope of this Regulation.

Article 7

Where the procedure laid down in this Article is to be followed, the representative of the Commission shall refer to the committee a draft of the measures to be adopted. The committee shall deliver an opinion within a time limit set by the chairman in relation to the urgency of the matter. The opinion shall be delivered by the majority specified in Article 148 (2) of the Treaty for decisions which the Council is required to adopt on a proposal from the Commission, the votes of the representatives of the Member States being weighted as indicated in that Article. The chairman shall not vote.

The Commission shall adopt the proposed measures if they are in accordance with the committee's opinion. If the proposed measures are not in accordance with the committee's opinion, or if no opinion is delivered, the Commission shall without delay submit to the Council a proposal concerning the measures to be taken. The Council shall act by a qualified majority.

If the Council has not acted within a period of one month of the proposal being submitted to it, the proposed provisions shall be adopted by the Commission.

Article 8

The Commission shall address a report to the Council and to the European Parliament at the latest either in 1990 or as soon as 60 % of the appropriations judged necessary have been committed, in order to assess the interim results achieved as compared with the objectives of the programme. This report shall be accompanied by suggestions for changes which may be necessary in the light of these results.

Article 9

With regard to the activities provided for in Article 1 (2), the Member States and the Community shall exchange all appropriate information to which they have access and which they are free to disclose concerning the areas covered by this Regulation, whether or not planned or carried out under their authority.

The information shall be exchanged in accordance with a procedure to be defined by the Commission after consulting the Committee, and will be treated as confidential at the supplier's request.

Article 10

This Regulation shall enter into force on 1 December 1987.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

ANNEX I

ESPRIT

The programme contains research and development projects, actions in basic research and accompanying measures.

A. Research and development projects

Research and development projects will be carried out in the following three sectors:

1. Microelectronics and peripheral technologies
2. Information processing systems
3. It application technologies

1. MICROELECTRONICS AND PERIPHERAL TECHNOLOGIES

Work in this sector will have to be addressed primarily at improving the competitiveness of the Community microelectronics industrial sector so as to enable it to provide the IT industry with full system capability through access to up to date functional components and subsystems based in particular on state of the art semiconductor technology. To this end and in support of the developments of application systems, it will encompass the provision of the technological capability to design, manufacture and test application-specific integrated circuits (ASIC) in a 'system on a chip' concept. Such circuits to range from high complexity random logic including several million elementary devices to very high speed lower complexity circuits capable of operating at up to 5 GHz.

The R & D activities to be pursued include:

— *High density integrated circuits:*

The goal is to provide random logic-integrated circuits (ICs), including up to four million gates for use in particular where a high degree of parallel processing is possible as, for instance, in processor arrays or systolic arrays. To this end it will be necessary:

- to develop user friendly CAD systems, including automatic layout and design verification tools (advanced silicon compilers),
- to develop low power high density processes, including the optimization of an automated flexible manufacturing line for high yield production.

— *High speed integrated circuits:*

The aim is to fabricate devices for use where processing of large quantities of information in real time cannot be assured by parallelism due to high serial bit rate. They are potentially valuable in supercomputers or front end processors for telecommunications systems. The target performance will be:

- operation between five and 10 GHz clock frequency or gate delays less than 50 ps,
- complexity greater than 10 000 gates.

The main activities towards this goal are:

- development of a very fast silicon bipolar process,
- GaAs FET technologies will also be considered, as appropriate,
- special CAD tools to optimize circuit speed,
- special packaging techniques for GHz operation.

— *Multifunction Integrated Circuits:*

The goal is to build a complete system on a chip with digital and analog functions, operating over a wide range of speeds. Complexity up to one million transistors, minimum achievable gate delay of 50 ps, power control and non-volatile memory capability will have to be implemented to meet the requirements of peripherals (display and LAN control, memory management), telecommunications equipments (voice and image processing), factory and office automation (intelligent sensors and actuators).

In order to enhance the performances of very large information systems, optoelectronic ICs will be developed and used to optically interconnect distributed processors for instance.

The main activities to be pursued are:

- tuning of manufacturing processes for dedicated application,
- adaptation of CAD tools to mixed functions, such as analog-digital device design.

Throughout the execution of the programme, a special emphasis will be given to definition of standards both on the software side (data exchange, tool portability between CAD system and manufacturing equipment) and on the mechanical side to meet requirements for higher degree of automation and flexibility.

— *Peripheral Technologies:*

This area of the programme is aimed at ensuring that Europe develops the specific technologies necessary to play a sustainable role in future peripheral systems developments. Topics requiring action are, in particular, those of magneto-optic and optical mass storage and retrieval systems, non-impact printers, displays, devices incorporating logic elements in conjunction with sensors, transducers, and actuators.

2. INFORMATION PROCESSING SYSTEMS

The main objective of this sector is to bring together tools and technologies from the hardware and software domains in order to enable the design and development of the information processing systems of the 1990s. Particular attention will be paid to new approaches to systems design which will enable high quality complex systems to be developed efficiently. To develop the methods and tools needed, it is imperative that all aspects of the system (e.g. architecture, interfaces) are considered while at the same time new technologies like knowledge engineering are integrated.

As a consequence, work in this sector will provide the capability of producing systems (of similar complexity to those produced now) with a significant increase in designer productivity. For example, the methods and tools developed will provide the mechanism by which the development costs of selected system components (e.g. microprocessors, real-time software modules) will be reduced to 10 % of the current development costs.

The R & D activities to be pursued fall into four complementary areas:

— *Systems design:*

This area addresses the process from the definition of the requirements of an IT system, through to its manufacture, distribution and maintenance.

Activities include:

- evaluation of methods and tools, guidance in method introduction and product evaluation metrics,
- integration and rationalization of integrated programming system environment interfaces, project support environments and knowledge-based techniques,
- reusable system components, automated generation of high quality programs for real-time systems, formal techniques and methods.

— *Knowledge engineering:*

This area includes the development of systems which help reasoning and decision making under conditions of uncertainty and incomplete information.

Activities include:

- knowledge acquisition, learning and adaptive systems, knowledge representation, knowledge manipulation and validation of knowledge-based system,
- natural communication processing and user interaction mechanisms,
- integration of knowledge engineering techniques into systems design.

— *Advanced systems architectures:*

This area includes, notably, parallel architectures aimed at overcoming system limitations and at supporting modular construction.

Activities include:

- parallel architecture and interconnection of cooperating processors, programming and verification techniques,
- distributed systems of semi-autonomous components,
- specialized architectures for signal processing and knowledge based information subsystems.

— *Signal processing:*

This area addresses the need to cope with the complexity of processing signals of varied physical nature (e.g. temperature, pressure, image, natural voice).

Activities include:

- formal description of information flow, symbolic manipulation,
- preprocessing, feature identification, classification, error correcting methods,
- system components for signal processing, real-time-systems,
- advanced technologies for multi-sensor signal processing systems.

3. IT APPLICATION TECHNOLOGIES

The main objective of this sector is to enhance European capabilities in the integration of IT into systems able to be used in a broad range of applications and to validate the results in selected, realistic environments.

The R & D activities to be pursued in IT application technologies fall into three complementary areas:

— *Computer integrated manufacturing:*

The objective is to provide the technology base which is necessary for system vendors in order to successfully meet the competitive requirements of the world market. At the same time, it is expected that the rapid uptake of these IT-based technologies will induce a completion of the modernization process in a wide range of manufacturing industries.

The scope of work will include the application of IT not only in discrete part production but to a wide range of industries up to and including continuous process.

The establishment of open system concepts to support multi-vendor operation is an important means of achieving the objective of the area.

Activities include:

- design and analysis systems allowing flexible product development so that time, materials and other resources for production are minimized,
- factory management, planning and production control so that availability and usage of equipment are increased, man-machine interactions for production planning and control systems optimized, real-time applications implemented and just-in-time production supported,
- robotics systems,
- integration of material handling systems (including robots) in the production and assembly process. Issues to be addressed are e.g. tool change, monitoring, washing, waste disposal, assembling and other tasks associated with production. Particular emphasis will be put on solutions for smaller batches,
- computer integrated control in process industries to create more efficient plant operation,
- architecture and methods for integration, including the development of methods and tools for installing, operating, and monitoring computer integrated manufacturing systems and the demonstration of early implementations addressing different manufacturing requirements.

— *Integrated Information Systems:*

This area addresses systems integration R & D for selected applications. Application domains include office environment and the domestic environment.

Activities include:

- user environment analysis and support in order to evaluate requirements, constraints, human factors, reduce introduction periods and increase productivity through improvement of user-system interaction. Particular emphasis will be put on the requirements of less skilled users and flexibility aspects,
- systems engineering comprising systems integration and validation tools, reliability, availability and security of systems,
- generic communication technologies and integrated office systems comprising multimedia handling on the basis of open system architectures, generation, routing, monitoring of office information, remote activities support and selected special functions,
- distributed systems with particular emphasis on integration of knowledge based systems and advanced distributed storage systems,
- data collection and monitoring systems in non-factory environments (e.g. home, laboratory) comprising telecontrol and networking of autonomous equipment, management of data acquisition systems.

— *IT application support systems:*

This area addresses the integration of basic IT components into subsystems. The major goal is to provide low cost technologies and large scale applicability. Particular emphasis will be put on modularity and fail-safe aspects.

Activities include:

- workstations for multiple application purposes,
- storage and processing subsystems for stand-alone and distributed systems,
- local network systems and related basic services,
- user interfacing subsystems (e.g. visual, vocal, manual),
- subsystems interfacing the physical environment (e.g. vision and environment understanding, laboratory data acquisition, monitoring and control).

Throughout these three sectors (microelectronics and peripheral technologies, information processing systems and IT application technologies) a limited number of technology integration projects will be undertaken. These projects will aim at meeting ambitious, well-defined industrial targets, will be replanned at an appropriate level of detail in the work programme, and normally require large-scale industrial efforts of a Community dimension.

B. Actions in basic research

The envisaged actions in basic research aim at complementing the proposed precompetitive IT R & D efforts by providing a Community dimension to fundamental research work in selected areas of long lead-time. They include promotion of high level professional training in areas of particular concern to the Community. The actions shall, in particular, encourage highly qualified research institutes in IT to become international in their orientation.

The work areas include:

- molecular electronics,
- artificial intelligence and cognitive science,
- applications of solid state physics to IT,
- advanced System Design,

and other areas of basic research which may be identified during the course of the programme.

C. Accompanying measures

The main objective of the accompanying measures is to provide the framework necessary to make optimum use of the R & D activities undertaken in the ESPRIT Programme and related activities.

The accompanying measures include in particular:

- coordination of Community and Member States research and development programmes and with programmes at international level, acquisition of information, both within the ESPRIT programme and from the world at large, and its appropriate dissemination,
- coordination and documentation of standards within the ESPRIT programme and their relationship with national and international standards,
- provision of means to ensure ease of communication, to serve the good technical execution of research and development projects as well as their management, and the appropriate dissemination of and access to their results, including an Information Exchange System (IES).

ANNEX II

The non-member States referred to in Article 2 (6) are:

- Republic of Austria,
 - Republic of Finland,
 - Kingdom of Norway,
 - Kingdom of Sweden,
 - Swiss Confederation.
-