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MEDIUM-TERM ORIENTATION FOR STEEL RESEARCH
IN RELATION TO THE GENERAL OBJECTIVES FOR STEEL
(1981 - 1985)

(under Article 55 2 (c) of the ECSC Treaty)

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PREAMBLE

All enterprises, research institutes and individual persons wishing to engage in research within the meaning of Article 55 of the ECSC Treaty may make application to the Commission of the European Communities for the grant of financial assistance.

Such applications must relate to the fields of science and technology outlined below in these medium-term guidelines. Upon receipt, applications will undergo selection by the Commission, which will bear in mind the need to ensure that financial expenditure is concentrated upon research projects which best satisfy the criteria of this medium-term programme.

The procedures to be followed in applying for financial support, the terms and conditions of aid as well as the obligations relating to the dissemination of the results of the research are given in a communication published in the Official Journal No. C 139 of 12 November 1974.

Application should be submitted before 1 September of each year in order to be effective in the following year.

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Article 55 of the Treaty concerning the establishment of the European Coal and Steel Community specifies that the Commission of the European Communities shall promote technical and economic research relating to the production of steel and the advancement in its consumption. For this purpose the Commission is required to organise appropriate collaboration between existing research centres.

The policy adopted for this collaborative research is consistent with the General Objectives for Steel in which the Commission defines, periodically, the future demand for steel, the required productive capacity, the desirable modernisation investment and the trends in raw material usage.

The total amount of financial assistance granted for technical research on steel since the programme commenced in 1955 is about 180 million European units of account which represents about 60 % of the total cost of the research undertaken.

The programme supported by the Community up to the present time has proved to be a successful means of stimulating and carrying out collaborative research and development on problems of common interest and in launching large and costly projects which could not be supported by individual companies alone.

The crisis now prevailing in the steel sector has called for an examination to be made of the future orientation of this effort to ensure that it meets the changing scientific, technological and economic requirements of the industry. The economic recession following the 1973/1974 oil crisis coupled with the changing pattern of iron and steel making in the world are basic causes of the current difficulties having revealed important structural weakness and a decline in international competitiveness.

It is evident that the recovery and the future financial viability of the steel industry in the Community will depend on its ability to enhance competitive performance through a programme of modernisation and restructuring. Maintaining or improving a technologically competitive position will be an essential element in this strategy which will only be realised if the appropriate research and development work is undertaken. The aim will be to combat foreign competition on Community markets across the whole range of products and to concentrate more on specialised and sophisticated products, advanced in type and quality, in export trade.

To achieve these goals, ECSC steel research must make a substantial contribution to common research objectives with attention being devoted to the most relevant short-to-medium term needs as well as, in selected areas, to directed longer term basic effort of practical relevance. Thus, the collaborative activity will generate scientific and technological information and "know-how" that will continue to provide an important basis upon which companies can plan and pursue their own individual programmes of research and development to tackle problems of a more specific and a more commercial nature.

The medium-term orientation for the programme presented in the next section has been drawn-up in collaboration with experts from the producer and user sectors of the steel industry and from steel research establishments in the Community. They are also in accordance with the general objectives of the common policy in R&D decided by the Council in his meeting of 20th December 1979. The objectives of future steel research are:

- to reduce production, processing and fabrication costs (including energy conservation) and enhance productivity,
- to improve product quality in its various aspects,
- to improve the service performance of the product and broaden the range of steel utilisation,

The criteria to be satisfied in the selection of applications for financial support by the ECSC are as follows:

- the interest to the steel industry of the Community,
- the main objectives of the programme (outlined above),
- the relevance of the research to short-to-medium term technological needs,
- the general objectives for steel defined periodically by the Commission under Article 46 of the ECSC Treaty.

The medium-term orientation of this technical research is outlined below for the two major sectors of the programme.

I.- PRODUCTION AND PROCESSING

I.1- In the process-oriented sector, research will be directed at reducing costs, both operational and capital investment, and at achieving improved and more consistent quality steel; also attention will be devoted to the longer-term development of alternative production routes. This will require technological progress in connection with:

- I.1.1- raw material and energy conservation, substitution and diversification,
- I.1.2- further optimization and control of existing production operations; modernisation of existing plant and equipment (to include enhanced availability, productivity and reduced maintenance),
- I.1.3- improvement and extension of continuous processing,
- I.1.4- development of new process technologies and production methods.

I.2- The areas where research and development will be needed include the following:

- I.2.1- preparation and reduction of iron ores (agglomeration, blast furnace technology, direct reduction),
- I.2.2- steel production (basic oxygen processes, electric arc furnace process, special production processes, theoretical studies),
- I.2.3- secondary steelmaking (ladle metallurgy),
- I.2.4- casting and solidification (notably continuous casting),
- I.2.5- rolling mill technology and other deformation processes (hot and cold), product quality,
- I.2.6- measurement and control techniques (development and adaptation of new methods of process control and automation for the inspection and assessment of quality as well as for the monitoring of industrial plant and equipment).

II.- PROPERTIES AND UTILISATION

II.1- The ability of the steel industry to satisfy the needs of the various branches of engineering will continue to be challenged since technology and economics will persistently call for improved standards of product reliability, durability and safety. Thus, research in the product-oriented sector will be concerned with the development of higher grade products of more consistent quality and with reducing costs in production and fabrication. In addition, more sophisticated and advanced products will be required for new market applications thereby stimulating the demand for steel. This will require progress in connection with:

- II.1.1- the detailed scientific understanding of the properties of steel and their development in close liaison with progress in chemical, process and mechanical metallurgy,
- II.1.2- the exploitation of steels to meet more demanding applications based upon an analysis of total engineering systems covering design and materials technology as well as economic and other factors,

- II.1.3- the generation of engineering property data that will better predict performance in service, aid in design development and contribute to the formulation and harmonisation of European specifications and codes of practise,
 - II.1.4- translation and exploitation of available basic understanding of the behaviour of steels e. g. structure-property relationships, into engineering practice.
- II.2- The technical areas where research and development will be needed include the following:
- II.2.1- structural, alloy and special steels (development, properties, conservation of rare alloying elements, fabrication, service performance),
 - II.2.2- joining and fabrication techniques and resulting properties (notably welding),
 - II.2.3- corrosion properties, surface protection and surface treatment,
 - II.2.4- strength, toughness and formability of steels,
 - II.2.5- fracture properties and fracture mechanisms (ductile, brittle, fatigue and high-temperature fracture, environmental effects, complex stresses, significance of flaws and design, scatter in properties)
 - II.2.6- utilisation of steels in construction and in engineering (joining and fabrication, structural design, performance under service conditions; technical data for design, specifications and codes of practise),
 - II.2.7- quality inspection and assessment techniques for fabricated parts and structures (non-destructive testing methods).

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