COMMISSION OF THE EUROPEAN COMMUNITIES

SEC(74) 4477 final

Brussels, 25 November 1974

FOUR MEMORANDA ON REQUESTS FOR
FINANCIAL AID UNDER ARTICLE 55 (2c) OF THE
ECSC TREATY FOR TECHNICAL COAL RESEARCH

COMMISSION
OF THE
EUROPEAN COMMUNITIES

E.C.S.C.

MEMORANDUM

concerning a joint request by the Steinkohlenbergbauverein, Essen (StBV), the Westfälische Bergwerkschaftskasse, Bochum (WBK), the Versuchsgrubengesellschaft, Dortmund (VGG), the National Coal Board, London(NCB) and the Centre d'Etudes et Recherches des Charbonnages de France, Paris (CERCHAR)
WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2(c) OF THE E.C.S.C. TREATY FOR THE PURPOSE OF RESEARCH IN THE FIELD OF AUTOMATION AND OUTEYE OPERATIONS UNDERGROUND.

I. General remarks

The increasing capacity of coal faces in the Community's mines, which results in a permanent increase in daily output per face, presents, among other things, problems concerned with coal-winning. In particular, two large series of problems arise in this connection. These are:

- the clearance of coal and the removal of spoil, the movement of the equipment required for extraction and the transport of personnel (in shafts as well as in roadways);
- the best possible organisation, and the most complete control possible, of the conduct of operations, and the automation of the most suitable processes.

The essential aims of further developments in these fields are a marked improvement in the results of underground operations (either directly by a saving in manpower or indirectly by making possible an even further intensification of coal-winning) and an improvement in mine safety and working conditions.

In past years the E.C.S.C. has already demonstrated great interest in these probelms by supplying financial aid for the realisation of a series of research projects.

./..

These projects have yielded very interesting partial results, particularly in connection with the problems of production and transport. The research work under discussion should nevertheless be continued with a view to optimising the equipment developed so far and adapting it to the ever-increasing demands of modern extraction. These demands are conditioned by the greater and greater intensification of extraction and by a regrouping of collieries with growing repercussions on the underground infrastructure. Furthermore, in other areas of outbye operations, such as those of closed-circuit control of districts and the utilisation of mini-computers, development has not yet passed the initial stages.

The countries applying for assistance, Germany, the United Kingdom and France, propose to carry out research work on the following subjects from 1975:

- Development, rationalisation and optimisation of systems of extraction and transport in roadways and shafts (StBV , WBK, VGG)
- New systems of work organisation and operational research (CERCHAR, StBV) and
- Control and automation of the aspects of exploitation under discussion (StBV and CERCHAR)

The proposed research projects will make use of the partial results of research work carried out earlier and are integrated with the previous work in a logical manner. The allocation of tasks takes account of various developments and the state of the art in the three coal-producing countries. A close collaboration between research workers and producers is completely assured.

II. Aim and programme of the research work

The programme for each part of the overall project can be summarised as follows:

1. Increasing the capacity of scraper chain conveyors (StBV)

   Increasing the capacity of scraper chain conveyors and the life of chains, and reducing the risk of accidents (chain breakage and derailment) by optimisation of all components and reducing wear as far as possible.

./..

- Construction of a test rig to determine the load capacity of pan connections (loads up to 300 Mp).
- Improvement of pan connections (reduction of wear, avoiding buckling).

Tests on several types of pans.

- Development and construction of a rig for testing chains under load.
- Reduction of wear and tear on the chain, the sprockets, the scrapers and the pans: reducing the power consumption of the conveyor by adapting the chain tension to the load.
- Research on a procedure for testing chains.
- Study of the behaviour of conveyors with curves in the horizontal and vertical planes.
- Determination of the influence of chain tension on various types of conveyors.
- Establishing criteria for the utilisation of various types of conveyor.

Cost: 1 063 000 DM (about 330 200 u.a.)

Duration: 3 years

2. Automation of transport and improvement of outbye services underground (StBV)

Further improvement of means of transport as a consequence of higher face output rates resulting from the concentration of collieries and in relationship to extraction equipment in the pits.

Belt conveyors

- Improvement of belts and belt connections, and continuous control of their condition.
- Determination of the constructional requirements of drivage stations, behaviour of fast belt conveyors under starting and running conditions.

./..

- Development of transfer points between scraper chain conveyors and belt conveyors, and between one belt conveyor and another, directed towards achieving unmanned operation.
- Improvement of belt and drum cleaning equipment. Installation of more suitable cleaning equipment.
- Determination of dynamic loads on the roller frames. Special types of structure for the frames and their positioning in the channels.
- Control of conveyor belts. Integrated steering and control system for automatic operation using electronic modules that conform to requirements for intrinsic safety.
- Crushers. If possible, development and surface trials of higher-capacity crushers, avoiding dust formation.

Material transport

- Autonomous diesel-hydraulic drivage (steering, power transmission)
- Devices for measuring the deterioration and tensile force of ropes.
- Inductive remote control of winches
- Reversible installations (transport of equipment and material)

Total cost: 5 754 000 DM (about 1 787 100 u.a.)
Duration: 3 years

3. Development, construction and testing of reliable control equipment for extraction equipment in shafts (VGG/WBK)

Continuation of the research programme "Technological research on the dynamic stresses developed in extraction equipment (shafts)" to improve the operational safety in high-capacity shafts.

./..

Determination of parameters needed for an exact examination of the condition of extraction equipment (treads, wear and tear of cage guides, deflection from the vertical, impulsive loads, accelerations,Etc.).

Development, construction and testing of the necessary measuring equipment according to the following criteria:

- Versatility and uninterrupted utilisation of extraction equipment.
- Automatic measuring equipment, taking available results into account.
- Flameproof equipment or intrinsic safety
- Low cost.

Cost: 870 000 DM (about 270 300 u.a.)

Duration: 3 years

4. New techniques for management and organisation (CERCHAR)

Further development and increased use of modern methods of management, planning and data treatment.

Analysis of data received at the control centre

- Perfecting the analyses of data for the management of plough faces (analysis of different idle times, prediction of operational conditions).
- Development of a similar system for headings.
- Treatment and exploitation of raw data

Strategic study of entire production units

- Development of a control system for steeply-inclined seams extracted by means of ANF winning machines and hydraulic packing (measurement devices, data transmission, recording and treatment of data).
- Development of a simulation system for room-and-pillar workings with "soutirage".

Cost: 1 300 000 FF (about 200 200 u.a.)

Duration: 3 years

./..

5. Study and elimination of weak points and bottlenecks (StBV)

Collection of basic data to improve the organisation of extraction and mechanical equipment. Numerical evaluation of idle times as a tool for management.

Collection of basic data

- Creation of a data bank.
- Analysis of the weak points of equipment and causes of mechanical breakdowns.
- Analysis of bottlenecks and causes of breakdown in organisation.
- Improvement of extraction and its organisation.

Costs of idle time

- Preliminary study of the existing system of cost allotment.
- Proposals for the evaluation of the cost of idle time.
- Proposal for modifying or extending the method of calculation.

Cost: 900 000 DM (about 279 600 u.a.)
Duration: 3 years

6. Development of a District Control Centre (StBV)

Development of a district control centre which will collect and process all data required for the operation of an entire production unit and will, as far as possible, be able to issue orders for the conduct of operations.

- Basic research and systems analysis.
- Development and adaptation of control, steering and communication systems (based on the existing face control desk).
- Extension of the system to transport operations in roadways
- Use of modular construction with intrinsic safety

Cost: 660 000 DM (about 205 000 u.a.)
Duration: 3 years

./..

7. Application of a mini-computer for processing management information and for the control of a transport system (NCB)

Exploitation of the potential of small computers in a conveyor/bunker transport system and for comprehensive monitoring and control purposes.

- The development and testing through operational use of an integrated system for computer control of coal clearance, including software suitable for widespread application throughout the industry.
- The introduction of computer programs in such systems for optimising bunker use, segregating stone from coal and for blending of coal feeds.
- The development of bunker and conveyor instruments and control equipment to permit the desired control of their functions through electronic signals.
- Examination of novel or improved information display equipment for visual or document presentation and its assessment in a practical colliery environment when appropriate.
- The specification, design when necessary, and provision of environmental detectors and data transmission equipment to provide comprehensive computer-aided monitoring of the environment and related colliery plant.

Cost: £ 304 000 (about 566,300 u.a.)
Duration: 3 years

III. Estimated cost and duration of research work

The estimated costs for the realisation of the research work, whose duration is expected to be 3 years, are as follows:

StBV	8 377 000 DM	2 601 900 u.a.
WBK/VGG	870 000 DM	270 300 u.a.
CERCHAR	1 300 000 FF	206 200 u.a.
NCB	304 000 £	566 300 u.a.
		3 644 700 u.a.

./..

IV. Research results

The Experts' Committee for "Outbye operations underground", which is already concerned with all research work in this field will also supervise and keep under review the execution of the research work that forms the subject of the requests.

The agreements to be concluded with the beneficiaries of the aid will define he rights and obligations of the contracting parties. They will be designed primarily to ensure that the research results will be made available to all interested parties in the Community, in accordance with Art. 55 of the E.C.S.C. Treaty.

V. Effects and importance of the research projects

It is difficult to express the effects of the envisaged research work in precise terms because the work involves a wide variety of aspects of mining technology. The research institutes making the requests anticipate that:

- the research work will lead, both directly and indirectly, to an increased output per man-shift and to a reduction in the cost of extraction, mainly as a result of uninterrupted coal-winning and extraction, of an increase in useful working time resulting from improved transport and better organisation of personnel, and of the control and automation of work processes;
- in particular, the work related to the development of transport of personnel and products, and to the organisation, control and automation of extraction processes will lead to an improvement in mine safety and working conditions (reduction of accident potential).

VI. Conclusions

In view of the importance of these research programmes and the opportunity that they present for rationalising some aspects of outbye operations underground and operations downstream of the coal face, taking account of their effects on the Community's coal industry in relation to increased output, reduced costs and

./..

their importance with regard to mine safety, and, finally, because of the interest in extending and making use of the results already obtained, the provision of financial assistance by the E.C.S.C. is judged to be appropriate.

For the realisation of this research programme, whose total cost is 3 644 700 u.a., the Commission envisages providing financial aid totalling 2 252 600 u.a., of which 2 186 900 u.a. is to cover its participation in the cost of research and 65 700 u.a. to cover the dissemination of information and other costs.

Distribution of aid

StBV	5 026 200 DM	1 561 100 u.a.
WBK/VGG	522 000 DM	162 200 u.a.
CERCHAR	780 000 FF	123 800 u.a.
NCB	182 400 £	339 800 u.a.
		2 186 900 u.a.

P.S. The rates of conversion from national currencies to u.a. are those of the second half of 1974.

XVII/320/74-E
Orig: D

COMMISSION
OF THE
EUROPEAN COMMUNITIES

(E.C.S.C.)

MEMORANDUM

concerning a joint request by the Steinkohlenbergbauverein, Essen (StBV), the Institut National des Industries Extractives, Liège (INIEX), the Institut d'Hygiène des Mines, Hasselt (IHM), the S.A. des Charbonnages de Campine, Houthalen (KSM) and the Université Catholique de Louvain (UCL) WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2(c) of the E.C.S.C. TREATY FOR THE PURPOSE OF RESEARCH IN THE FIELD OF FIRE-DAMP AND VENTILATION.

I. General Remarks

Firedamp constitutes one of the greatest hazards in deep coal mines and is a very serious impediment to the regular operation of workings.

Problems related to firedamp are assuming greater importance because large quantities of methane are released as the output of coal from each production unit increases. These problems also give rise to increasing demands on mine ventilation which is already made difficult by the increasing extent and dispersion of the workings.

In past years the E.C.S.C. has contributed, by means of financial support, to the realisation of a series of research projects concerned with the fundamental and theoretical problems of methane release, with the practical control of this release and with the calculation of ventilation requirements, all in accordance with the relevant legislation. It is now necessary, however, to make increased practical use of the results obtained so far in order to give as much assistance as possible in the planning of new workings, taking into account the estimated release of methane, in taking the corresponding essential measures, and in installing systems of methane control that give a very high degree of security.

In this way the Community's coal mines will be given the opportunity to develop high-performance faces that will not be hampered by the release of methane, to attain the highest level of safety with regard to firedamp, to perfect ventilation as far as possible and, in parallel, to combat the release of dust by techniques of water injection at great depth.

./..

Countries such as Germany and Belgium have presented requests for financial assistance and propose, from 1975 onwards, to undertake research work on:

- methane and dust, with particular reference to the development of high-performance faces (StBV and INIEX) and
- control and automation of ventilation by means of computers (INIEX, IHM, KSM, UCL).

The research envisaged is based on the partial results already obtained from earlier research and constitutes a logical continuation of the programme. The allocation of tasks takes account of the various developments in progress as well as of the state of the art in the different countries. A close collaboration between research workers in the coal-producing countries of the Community is assured.

II. Aim and programme of the research work

The programmes for the various parts of the overall project can be envisaged as follows:

1. Methane control in high-output faces (StBV)
   Further investigation into better methane control in consequence of increased gas emission due to higher face production rates.

   Degasification of seams before extraction

   - Mathematical description of gas migration in the coal as a basis for an exact precalculation of gas emission in the face being worked and in neighbouring seams.
   - Evaluation of seams in relation to their suitability for prior degasification.
   - Influence of water injection on gas emission from the seam being worked.
   - Relationship between water injection and gas emission.
   - Effect of wetting and hydraulic fracking of the coal.

./..

Optimisation of Degasification

- Optimisation in conventional ventilation systems by complete, rapid and reliable control.
- Adaptation to new ventilation systems. Studies of the positioning of bore holes in various roadways.
- Methane drainage by means of large bore holes (200m long and 200mm diameter) positioned in neighbouring workings.

Cost: 2 415 000 DM (about 750 100 u.a.)

Duration: 3 years.

2. Improved control of firedamp and dust (INIEX)

Continuation of previous work on methane release aimed at the elimination of natural obstacles to increased output from faces.

Prediction of specific gas emission

Modifications to the method of direct measurement of gas concentration to eliminate the influence of moisture on the results.

Study of the laws of gas emission

Establishment of ventilation rules based on the concentration of methane in the air stream.
Systematic study of specific gas emission in order to determine the influence of various parameters (planning, sequence of extraction, etc.)

Influence of the rate of advance of the face

Detailed study of the relationships between the specific gas emission and the rate of advance of the face as a basis for the exact prediction of gas emission in high-output faces.

Accumulation of methane in longwall faces

New solutions to the problem of methane accumulation at the downstream ends of longwall faces.

./..

Methane drainage

Increased use of boreholes in the wall and of old galleries above the working seam.
Improved utilisation of drainage equipment based on permanent, and possibly automated, control.

Long distance water injection

Systematic study of the characteristics of water injection and of the control of air conditions. Influence of water injec ion on the basic and additional gas emission in the working seam and in neighbouring seams, and on dust suppression.

Drainage from abandoned mines

Continuation of current work on techniques of methane recovery and their results to assess the applicability of the method to abandoned mines.

Cost: 19 460 000 FB (about 400 000 u.a.)
Duration: 3 years

3. Practical application of computer-based ventilation control (IHM, INIEX, UCL, KSM)
Continuation of current work aimed at the practical use of the methods of ventilation control by computer that have already been developed. (Application of the TF-24 system and of IBM-7 and IBM-370 computers).

- Development, construction and application of regulating devices for the control of air distribution underground (modification of the main fan characteristics, control of by-passes and regulator doors).
- Design of a gas emission model for the panels studied to allow the determination of relationships between ventilation rules and methane measurement.
- Continuation of work on the adaptation of software to conditions underground, on programmes for automatic actualisation of the network model and for the detection of irregularities, and on programmes for the calculation and control of ventilation.

Cost: 25 000 000 FB (about 513 800 u.a.)
Duration: 3 years

III. Estimated cost and duration of the research work

The provisional costs for the realisation of the research work, which will be spread over a period of 3 years, are summarised below:

- StBV	2 415 000 DM	750 100 u.a.
- INIEX/IHM/ UCL/KSM	44 460 000 FB	913 800 u.a.
		1 663 900 u.a.

IV. Research results

The E.C.S.C's experts' Committee for "Firedamp and Ventilation", which is already concerned with all research work in this field will also supervise and keep under review the execution of the research work that forms the subject of the requests.

The agreements to be concluded with the beneficiaries of the aid will define the rights and obligations of the contracting parties. They will be designed primarily to ensure that the research results will be made available to all interested parties in the Community, in accordance with Art. 55 of the E.C.S.C. Treaty.

V. Effects and importance of the research projects

The research work envisaged will have favourable effects in two directions.

First, the control of methane release is an indispensable requirement for the unhindered operation of coal faces. This is particularly the case for high-performance workings with increased rates of face advancement. In the future, such high-performance faces will be even more important than at present and will contribute to the technical and economic performance of the Community's coal mines.

Secondly, all progress related to methane and dust control and the improvement of mine ventilation has a direct and incalculable influence on the safety and working conditions in deep mines. This progress and improvement is an indispensable postulate for the further development of the Community's coal mines.

./..

VI. Conclusions

Given the importance of this research programme, the opportunities that it presents for further development of the coal mines, its fundamental effects on mine safety and working conditions and, finally, the value of obtaining more detailed knowledge in this field and of applying the results already obtained, the provision of financial assistance by the Community is judged to be appropriate.

For the realisation of this programme, whose cost is 1 663 900 u.a. the Commission envisages providing financial aid totalling 1 028 400 u.a., of which 998 400 u.a. is to cover its participation in the cost of research and 30 000 u.a. to cover the dissemination of information and other costs.

Distribution of aid

StBV	1 449 000 DM	450 100 u.a.
INIEX/IHM/ KSM/UCL	26 676 000 FB	548 300 u.a.
		998 400 u.a.

P.S. The rates of conversion from national currencies to u.a. are those of the second half of 1974.

COMMISSION
OF THE
EUROPEAN COMMUNITIES

E.C.S.C.

MEMORANDUM

concerning a joint request by the Centre d'Etudes et Recherches des Charbonnages de France, Paris (CERCHAR), the British Carbonisation Research Association, Chesterfield (BCRA) and the Steinkohlenbergbauverein, Essen (StBV) WITH A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2(c) OF THE E.C.S.C. TREATY FOR THE PURPOSE OF RESEARCH IN THE FIELD OF COKE.

I. General remarks

In the near future the Community's requirements for coal to be transformed into coke will be maintained at least at their present level because, despite the introduction of new techniques and the progress that has been made, the metallurgical industry will continue to consume coke for many years to come. Taking into account the evolution of the price of coals from third countries, it is to be expected that more and more recourse will be had to indigenous coals by the incorporation into coking blends of significant quantities of coals that have, up to now, been regarded as unsuitable for coke making, and by the use of substitute products such as formed coke. Better, or improved, coking techniques, capable of maintaining or improving the quality, as well as the quantity and consistency, of coke will help the Community's iron and steel producers to satisfy future demands.

The work carried out in the member states, largely under the aegis and with the support of the E.C.S.C. (cf. earlier programmes on coke ovens) has already borne fruit and considerable progress has been made in the acquisition of a better knowledge of the processes that form the basis of metallurgical coke production. This knowledge has already been put to use and has resulted in a very marked improvement in the properties of coke, taking account of the diminishing supply of the types of coal previously considered essential for coke manufacture.

./..

It is currently thought desirable to optimise the application of the most recent techniques and to find out whether the benefits obtained can be extended by applying these techniques either individually or in combination: examples are; preheating of the charge, high-capacity ovens in special materials (magnesite), programmed carbonisation, the manufacture of formed coke from flame-coals, etc.

The research proposals which form the subjects of the requests complete the work in progress and are completely integrated with it. They are concerned with:

CERCHAR

Improvement of coke quality, analysis of the improvement in quality obtained by preheating.

Manufacture of formed coke from flame-coal and tests in a blast furnace.

StBV

Material and energy balance for coke production in high-performance ovens (magnesite ovens).

BCRA

Carbonisation of normal and preheated blends in tall ovens using gravity and pipeline charging techniques. Comparison with conventional ovens.

II. Aim and programme of the research work

(1) Study of the influence of charge preheating on the quality of metallurgical coke (CERCHAR)

A systematic study of the basic processes of coke manufacture in order to reveal all the possibilities of obtaining the maximum profit from preheated charging.

Research into the influence of preheating

- Examination of the rôle of the conditions of heat transfer into the oven chamber.
- Comparison with results obtained by conventional methods.

./..

Study of blends

- Study of coal blends with a view to obtaining the maximum upgrading of weakly-caking coals.
- Systematic study of the addition of anti-fissuring coke breeze and of the optimal conditions for its production.

Investigation of production parameters

- Investigation of factors having a general influence on the classical parameters of coke production.
- Investigation into the possibility of producing a well-calibrated, highly-resistant coke and of the rôle of the preheating technique.

Influence of blends on pressure (preheated blends)

Precautions to be taken in choosing components and in the conditions of blend preparation in order to avoid the risk of pressure on the oven walls during carbonisation of preheated blends.

Total: 1 998 000 FF (about 316 900 u.a.)

2) Formed coke (CERCHAR)

Continuation of current work and extension to the semi-industrial stage.

- Manufacture of about 2 800 t of coke from 5 000 t of flame-coal.
- Study of the behaviour of this coke in a blast furnace.
- Carbonisation of 250-300 t of strongly-swelling, high-volatile coal after preliminary oxidation in order to evaluate the possibility of producing a coke of satisfactory quality.

Total: 1 500 000 FF (about 238 000 u.a.)

3) Material and energy balance in high-performance ovens (StBV)

Reduction of operating costs, reduction of heat losses and assurance of quality in the production of coke from high-performance magnesite ovens.

- Development of a programme for the supply of heat and the setting up of the related energy balance.

./..

- Substitution of constant-rate oven heating by a programmed heat supply, taking into account the temperature conditions in high-performance ovens.
- Setting up the yield balance for high-performance coke production. Constructive technological measures aimed at improving the relationship between the yields of coke and by-products (particularly to avoid increasing the yield of gas and gas emissions).
- Development of a model for the formulation of suitable blends of coking coals.
- Investigation into the influence of variations in blend composition, and in the drying and preheating of charges, in a magnesite oven, taking account of the increased reaction velocity.

Total: 3 025 000 DM (about 939 600 u.a.)

(4) Carbonisation in tall ovens (BCRA)

Study of the production of high-quality metallurgical coke from various coals in a tall test oven (6.50 m.high). Determination of the influence of charging techniques for normal and pre-heated coals on oven performance, the yield and quality of coke and the production of gas and by-products. Comparison of these data with those obtained from conventional ovens.

Charging techniques

- Gravity charging of wet or preheated coal (charging car)
- Pipeline charging of preheated coal by the Coaltek system.

Preheating techniques

- Rosin entrainment preheater
- CERCHAR fluid bed/entrainment preheater

Coals

- Low volatile coals
- Medium volatile coals
- High volatile coals

} Various combinations

- Blend additives, e.g. coke breeze
- Commercial blends, i.e., blend compositions corresponding to those for industrial installations.

Total: £ 248 000 (about 462 000 u.a.)

III. Estimate of expenditure and duration of work

The estimated expenditure for the completion of the work which will take 3 years, is as follows:

CERCHAR	3 498 000 FF	(about 554 900 u.a.)
StBV	3 025 000 DM	(about 939 600 u.a.)
BCRA	248 000 £	(about 462 000 u.a.)
		1 956 000 u.a.

IV. Research results

The experts' Committee for "Coke Oven Techniques", which is already concerned with the progress of all research in this field, will also supervise and keep under review the execution of the work which forms the subject of these requests.

The agreements to be concluded with the beneficiaries of the aid will define the rights and obligations of the contracting parties. They will be designed primarily to ensure that the research results will be made available to all interested parties in the Community, in accordance with Art. 55 of the E.C.S.C. Treaty.

V. Conclusions

The results to be expected on the technical and economic levels will contribute towards improving the output and capacity of coke ovens, as well as to the quality of coke, and will enable the range of coals suitable for carbonisation to be extended. They will also help, indirectly, to ensure the supply of coke for the Community's iron and steel industry.

Given the importance and interest of this research work in the field of coke, the provision of financial aid by the Community is judged to be appropriate.

For the realisation of the research programme, whose cost is about 1 956 500 u.a., the Commission envisages providing financial aid totalling 1 209 200 u.a., of which 1 173 900 u.a. is to cover its participation in the cost of research and 35 300 u.a. to cover the dissemination of information and other costs.

./..

Distribution of aid

CIRCOLAIR	2 090 000 FF	(about 332 900 u.a.)
StBV	1 815 000 DM	(about 563 800 u.a.)
BCRA	148 800 £	(about 277 200 u.a.)
		1 173 900 u.a.

P.S. Rates of conversion from national currencies to u.a. are those of the second half of 1974.

COMMISSION
OF THE
EUROPEAN COMMUNITIES

E.C.S.C.

MEMORANDUM

concerning a request by the National Coal Board, London (NCB) and the Centre d'Etudes et Recherches des Charbonnages de France, Paris (CERCHAR) with A VIEW TO OBTAINING FINANCIAL AID UNDER THE TERMS OF ARTICLE 55 § 2 c) OF THE E.C.S.C. TREATY FOR THE PURPOSE OF RESEARCH IN THE FIELD OF THE PREMARATION AND THE COMBUSTION OF COAL AND OF THE BENEFICATION FO SPOILS

I. General remarks

The adaption of integreated mechanical coal preparation plants - carrying out on-site treatment of raw coal - must keep pace with the development of modern coal winning techniques : in creased production higher spoil content of raw coal together with greater moisture content resulting form the application of dust suppression techniques and the quality demands of the market.

These labour intensive surface installations which militate against good returns on coal, cawed by technical improvements and enhanced technology; particulary automation and the process of command programmes for various operations, contribute to improved coal costs. It is for this reason that the NCB propose to undertable research work on separation of fines from raw coal and to proceed with the automation and computerized command of coal preparation plants.

The benefication of base products, especially spoils (wash slurry) can only give added value to the industrial products.

These synthetic products made of the mining operation and increasingly called upon to meet grawing demand and in addunin help avvid the risk of a shortage of natural materials.

Furthermore, mining exploitation and coal washing create considerable quantities spoil which takes up on ever increasing acreage of storage, space, disfigures The lattere in effect could by new processing techniques, the transformed into material destined directly or indirectly for the civil engineering service (concrete blocks, light aggregates, roadway ballast, etc...).

../..

the landscape requires excessive use of tips and creates another element of danger. These waste products must therefore be viewed as a cheap source of raw material and profitably exploited. Several research projects are being financed by the ECSC and these need to be intensified.

The NCB and CERCHAR propose therefore to convinve to research the benefication fo spoils and their use as construction materials.

In parallel with these major projects work is being done in the area of pulverized coal combustion - an area partially eclipsed during the years of the coal crisis. CERCHAR already studying this field under ad grant form the ECSC, proposes raw to examine in greater depsth the formation of nitraus oxides in the combustion of pulverized coal and their development in smoke coaling circuits, in to maximize the elimination of noxious oxides of sulphur and nitrogen.

This research will impact directly on the fight againt atmospheric pollution.

II. Aim and Programme of the research work

1. Extraction of fine particles from raw coal (NCB)

Improvement and further development of new methods for the operation and preparation of fine particles in consequence of increase in the amount of fine particles, ash content and moisture.

- Concentration on methods of extracting fines down to 1.0 mm from raw feeds by methods other than conventional sizing.
- Considering and proving the principles of the new installations;
- Design and tests of prototype and production machines.
- Investigation into the effects of loading per unit area, moisture, size, ash and clay fines on the performance efficiency.
- Adaption with automatic selection of various rates of dry fine extraction.
- Reliability of the system taking into account the variability of the raw feed characteristics and market requirements.
- Development and test of a control system.
- Improvement of present commercial screens and screening techniques.
- Establishment of reliable data under continuous operation at the Test Screen Plant.

Total cost: 322 £ (about 599,800 u.ac.)

2. Automation and Computer control of coal preparation plants (NCB)

Reducing costs and manpower, increasing plant capacity and improving quality control and consistency of products by the application of reliable automatic computer-based control systems to preparation plants.

- Investigation into the basic production parameters.
- Tests of measuring devices to ascertain the reliability and accuracy of their transducers under operating conditions.
- Assessment of the feasibility of applying mini-computers and of the refinements required to process machines responding to automatic control.
- Carrying out of cost/benefit studies.

Total cost: £ 313,000 (about 583,000 u.ac)

3. Benefication of spoils (CERCHAR)

Improvement of the production of artificial aggregates to meet an increasing demand and a shortage in natural materials.

Grains and ultra-lightweight sands

- Laboratory study of the porogeneous and caking reagents.
- Production of grains > 5 mm in a rotary-kiln, and by the expansion method altering the partial pressure of the gas.
- Production of ultra-lightweight sands ≤ 5 mm in a vertical expansion-kiln.
- Study of the paste method in pneumatic dryers.

Prefabricated lightweight-aggregates

- Production of concrete blocks from light grains.
- Utilisation of binders obtained from a calcined blend of flotation tailings and limestone.
- Optimal calcination conditions in view of the hardeneing and the best properties of the blocks.
- Lightweight partitions and polymeric foams
- Investigation into the suitable polymers.
- Composition of the blend: Resin, catalyst, porogeneous and tension-active reagents.
- Optimal conditions for the production of lightweight partitions.

Total cost: 1,700.000 FF (about 269,700 u.ac).

4. Utilisation of Colliery spoil in civil engineering application (NCB)

Continuation of the research project "Utilisation of Colliery Spoil" (1973-1975). Improvement of the environment by increasing the practical uses of spoil; meeting the anticipated shortfall in the supply of natural aggregates.

- Further investigation into the use of cement-established spoil for road sub-bases, foundations and special applications (e.g. blocks as mining supports).
- Development of methods of upgrading spoil by heat-treatment without further atmospheric pollution, particularly in fluid beds to produce both a lightweight aggregate and a fine refractory powder suitable for further processing (refractory shapes, skid-resistant roadstone, dense aggregate).

Total cost: £ 203,000 (about 378,200 u.ac.)

III. Estimate of expenditure and duration of work

The estimated expenditure for the completion of the work which will take 2-3 years, is as follows :

a) CERCHAR

- Benefication of spoils	1.700.000 FF	269.700 u.ac
- Coal dust firing	1.404.000 FF	222.700 u.ac
	3.104.000 FF	492.400 u.ac

b) NCB

- Extraction of fine particles	322.000 £	599.800 u.ac
- Automation of coal preparation plants	313.000 £	583.000 u.ac
- Utilisation of colliery spoils	203.000 £	378.200 u.ac
	838.000 £	1.561.000 u.ac

Total cost : 2.053.400 u.ac

IV. Research results

The expert's Committee which is already concerned with the progress of all research in this field, will also supervise and keep under review the execution of the work which forms the subject of these requests.

The agreements to be concluded with the neneficiaries of the aid will define the rights and obligations of the contracting parties.
They will be designed primarily to ensure that the research results will be made available to all interested parties in the Community, in accordance with Art. 55 of the E.C.S.C. Treaty.

V. Conclusions

Given the importance and interest of this research work, the provision of financial aid by the Community in judged to be approviate.
For the realisation of the research programme, whose cost is about 2.053.400 u.ac, the Commission envisages providing financial aid totalling 1.269.000 u.ac, of

../..

which 1.232.000 u.ac is to cover its participation in the cost of research and 37.000 u.ac to cover the dissemination of information and other costs.

Distribution of aid

CERCHAR	: 1.862.400 FF	(295.400 u.ac)
NCB	: 502.800 £	(936.600 u.ac)
		(1.232.000 u.ac)

P.S. Rates of conversion from national currencies to u.ac are thses of the second half of 1974.

COMMISSION
OF THE
EUROPEAN COMMUNITIES

E.C.S.C.

4 MEMORANDA

concerning requests for financial aid for technical research on coal under the terms of Art.55 §2(c) of the E.C.S.C. Treaty (Budgetary year 1975).

A large number of requests for financial aid, under the terms of Art. 55 §2(c) of the E.C.S.C. Treaty, for the purpose of research have been submitted to the Commission for the financial year 1975.

The projects have been studied and examined by the services of the Commission in collaboration with the Coal Research Committee with a view to making a selection that allows the financial efforts of the Commission to be concentrated on research projects which are included in the "Medium-term coal research aid programme (1975-1985)" (Published in the Official Journal of the European Communities No. C60, 25th May 1974) and which best fit the criteria given therein.

The proposed selection, which includes 19 projects representing an overall total of 9319 million u.a., received a favourable judgement after examination by the Coal Research Committee at its meeting of 15th October 1974.

The total aid necessary for the realisation of this research programme is 5 759 200 u.a., of which 5 591 200 u.a.is to cover the Commission's participation in the costs of research and 168 000 u.a. to cover the dissemination of information and additional costs.

Four memoranda, corresponding to the research projects contained in six fields of the medium term programme, have been drafted. These are:

./..

- "Firedamp and Ventilation" (C AIII)
  Memorandum Doc. XVII/320/74
  Aid: 998 400 u.a.
- "Automation and Outbye Operations Underground" (AV/AVI)
  Memorandum Doc. XVII/319/74
  Aid: 2 186 900 u.a.
- "Preparation and Upgrading Processes" (CI/CIII)
  Memorandum Doc. XVII/323/74
  Aid: 1 232 000 u.a.
- "Coking and Briquetting of Coal" (CII)
  Memorandum Doc. XVII/322/74
  Aid: 1 173 900 u.a.