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C O M M O N M A R K E T · E U R A T O M · C O A L & S T E E L C O M M U N I T Y

EURATOM ISSUES ANNUAL REPORT, CITES
ATLANTIC PARTNERSHIP IN NUCLEAR FIELD

WASHINGTON, D. C., April 8 -- The Commission of the European Atomic Energy Community declared in its Sixth General Report, issued today, that "Euratom has now acquired sufficient experience and weight for the U.S.-Euratom Agreement to be tantamount to an Atlantic Partnership in the nuclear field."

The report, which the Commission issues annually to the European Parliament, covers all Euratom's activities during the period March 1962 through February 1963.

By 1968 or 1970, the report predicts, nuclear power stations in the Community will be reasonably competitive with other sources of energy, with a utilization rate at or above 6,000 hours a year.

According to the report, Euratom's program for the research and development of fast reactors is the most important item in its second five-year research program (1963-67). As a partner in each of the main fast reactor projects now envisaged in the Community, the Euratom Commission can now ensure to a large degree the coordination of all Community research in this sector.

Of the British negotiations toward Euratom membership, the report says: "They brought out more clearly the importance, the reciprocal technical advantages which British membership would have offered... The Commission considers that the interruption of the negotiations with the U. K. should not compromise such prospects..."

A summary of the Commission's report is attached:

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Brussels, April 1963

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Monday, April 8

SUMMARY OF

EURATOM SIXTH GENERAL REPORT

The most important activities of the European Atomic Energy Community during 1962, as outlined in the Euratom Sixth Annual General Report were the adoption in July of the \$425 million Second Five-Year Research Program; the expansion of research and other activities; the opening of the negotiations for British accession to the Community; and the studies undertaken by Euratom and elsewhere which generated optimism for the economic prospects of nuclear energy in the second half of the decade, some nuclear power stations now under construction in the Community "being on the threshold of competitiveness."

The broad and widening scope of Euratom's activities is illustrated by the fact that the total staff employed rose by 23 per cent -- from 1,966 in March 1962 to 2,416 in February 1963. Euratom personnel is employed in 40 locations, 24 in the Community, 13 in the United States, and three in the U.K. Of the increase of 450 employed registered during the year, all but 17 are employed under the research budget, the administrative staff rising from 559 to 576. The research budget authorized for 1962 was \$71.4 million, the administrative budget \$10.2 million, subsequently raised by supplementary budgets.

On the negotiations for British membership, the report says: "They brought out more clearly the importance, the reciprocal technical advantages which British membership would have offered the two sides had it been possible and the interest of the Community and the U.K. in closer co-operation"... "The Commission considers that the interruption of the negotiations with the U.K. should not compromise such prospects" ... "It hopes that the 'positive elements' resulting from the discussions will help to strengthen the fruitful co-operation which has developed between the U.K. and the Community since 1959."

EURATOM'S INDUSTRIAL ROLE

Power Production

By the end of 1962, 174 MWe of nuclear capacity were 'on the line,' of which 149 MWe were in France. Production of electricity from nuclear sources totaled 500 million kwh in 1962 against 266 million kwh in 1961. Installed capacity will total around 2,000 MW by the end of 1965, 2,500-2,800 MW by the end of 1967 (of which 1,500-1,700 MW will be fueled by natural and 1,000-1,150 MW by enriched uranium). Nuclear electricity production in 1967 is expected to be about 17,000 million kwh, 3 per cent of all Community electricity output. Nuclear capacity is put at 3,500-4,000 MW for 1970 and 10-16,000 MW for 1975, the assumption being that it will double in the 70s every three years.

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Outlook for Competitivity

- "Nuclear power stations will already be reasonably competitive in many areas of the Community between 1965 and 1967 and will be so in the Community as a whole towards 1968 or 1970 with a utilization rate at or above 6,000 hours a year."

- "New power stations of the second generation (KRB, SENA and EDF3), now in course of construction, are on the threshold of competitiveness and permit the forecast that third-generation realizations will provide the proof that nuclear energy is economic."

Participation in Power Reactor Projects

Contracts have been signed for Euratom to contribute \$7 million, \$4 million and \$8 million to the 150-MW SENN, 200-MW SIMEA and 210-242 MW SENA power reactor projects. Requests have been received from 28 European firms for the detachment of 61 members of their staff for the pre-operational and start-up phases of these reactors; and 29, plus 8 Euratom personnel, have already been assigned to the projects. In this way, public and private organizations in the Community are being kept abreast of the progress of the project. In addition, technical reports are submitted to the Commission, which distributes them in member countries.

Two further projects, the German KRB for its 237-MWe boiling-water reactor and the Dutch SEP for its 50-MWe BWR have also requested Euratom participation.¹

The U.S.-Euratom Joint Program

Two projects have been accepted in response to the second invitation under the U.S.-Euratom Agreement for joint power projects to be constructed by the end of 1965. They are the Franco-Belgian SENA (on which construction work has started) and the German KRB reactors. These projects respectively will benefit from loans of \$16.25 million and \$20 million from a line of credit opened with the American Export-Import Bank.

Nuclear Ship Propulsion

Work under the four association contracts (with the Italian Fiat-Ansaldo-CNEN, with the Dutch RCN, and two with the German GKSS) has continued and has been complemented by a study of the problems posed by the entry of nuclear ships into European ports. Three meetings of the Nuclear Ship Propulsion Liaison Committee, in which the Commission participates, took place in 1962: its function is to facilitate co-ordination between the projects.

¹The decision has now been taken to allocate \$8 million to the KRB and \$5 million to the SEP projects.

Re-treatment of irradiated fuel

The Commission has been chiefly concerned during 1962 with the problem of the re-treatment of highly enriched fuel, in particular MTR elements (enriched uranium in aluminum alloy) from research reactors operated by Euratom directly or jointly with other organizations. At the end of 1962 studies were under way of three possible solutions for the re-treatment of enriched fuel: extension of the Eurochemic facilities, the Italian EUREX project, and a French project for the treatment simultaneously of fast reactor and MTR elements. The Commission has also examined the possibility of the re-treatment of MTR fuel in the United Kingdom.

Radioisotopes in industry

The Eurisotop information bureau, set up in 1961, was mainly concerned in 1962 with: the development of methods and equipment for isotope applications (20 development projects having been undertaken with national laboratories); with information and documentation on the use of isotopes, an information and consultation service having been formed; and the co-ordination of work in the Community on the application of isotopes through holding meetings of isotope users on certain clearly-defined themes.

Free movement - materials, equipment, qualified labor

Effective tariff levels were fixed in March 1962 (see Fifth General Report). Thanks to the absence of internal tariffs, intra-Community trade in nuclear products continued to expand, while trade with non-member countries also developed.

In March, a directive was approved by the Council of Ministers obliging member states to take the necessary steps for the automatic granting of the necessary authorization for the free circulation of qualified labor (as defined in Article 96 of the Treaty).

Supplementary Insurance Convention

The Supplementary Nuclear Liability Convention (supplementing the Paris Convention of the OECD countries signed in July 1960) was signed early in 1963, following a diplomatic conference, by 13 countries (including the six of Euratom). (The Supplementary Convention raises the level of damages for which governments must insure that operators have coverage from \$15 million to \$70 million, while the signatories collectively provide coverage for additional amounts up to a maximum of \$120 million.) The ratification of the two conventions will in most cases take place simultaneously and, once in effect, an important element of uncertainty confronting nuclear investors will have been removed.

THE RESEARCH PROGRAM

In July 1962 the Second Five-Year Research Program was approved by the Council of Ministers. It provides for an expenditure of \$425 million during 1963-67. The First Program ended in 1962, and by the end of the year \$194.5 million out of the \$215 million authorized for this program had been engaged. Thus for 1963-67 the credits will amount to \$445.5 million (plus a further \$3.5 million owing to annulments in 1962).

The Second Program provides for work to continue along the lines set under the First, while widening the scope of research to a number of new fields, roughly half of the expenditure being in the establishments of the Joint Research Center and half under contracts.

The Joint Research Center

- Ispra (Italy)

The development of the Ispra establishment continued, the staff increasing from 1,071 to 1,250 during the year. The construction of the ECO critical assembly, the first reactor to be built at Ispra by the Community, was started for the ORGEL project; ECO is expected to be in operation by the end of 1963. The decision was taken to construct the ESSOR specific test reactor, construction was started, and criticality is expected toward the end of 1966. Together, ECO and ESSOR will serve the research and development program in the organic liquid-cooled, heavy water-moderated field, on which work at Ispra is being concentrated. Some ORGEL work, however, is being performed under contract, and 25 such contracts were signed with industry during 1962. With the extension of the co-operation with Canada and of the technical contacts with the U.S., and with the holding of a 'three-cornered' meeting in the U.S., a complete co-ordination is now assured between the three main organic reactor programs in the world.

Among other points on Ispra, the transfer of the Ispra Center to Euratom was completed on March 1, 1963, when the Ispra-I reactor, hitherto operated by the Italian authorities, was taken over by the Community. The metallurgical service was installed. Use of the CETIS (scientific data processing center) equipment greatly increased. The fields of research for which the CETIS computers were in use included reactor calculations, numerical analysis and economic evaluation, Franco-German translations, the use of a Russo-English Program developed by the University of Georgetown Group, Washington, D. C., and automatic documentation for the Information and Documentation Center.

- Petten (Netherlands)

The Petten establishment was formally instituted by the transfer from the Dutch authorities of the high-flux materials-testing reactor (the RCN remaining responsible for the reactor's operation for a four-year transitional period) along with the terrain on which laboratories are to be constructed for the analysis of irradiation samples. The Petten team will be primarily concerned with the operation of the high-flux reactor; but research is already under way, under agreements with national authorities, on certain problems associated with the use of H.F.R., as well as the development of fuels.

- Karlsruhe (Germany)

Work started during the year on the construction of the Karlsruhe establishment. Karlsruhe will be the pivot of all Community research in the field of plutonium, and its work will be closely linked to the fast reactor program. Work will be centered on the study of plutonium as a reactor fuel, studies ranging from the properties of plutonium to its manufacture by laboratory methods in a prototype fuel element; the transplutoniums will also be studied (this being

about 10 per cent of the total activity). The Karlsruhe staff numbered 55 at the end of 1962, most of them undergoing training in national centers or at Hanford, Washington, in the U. S.

- Geel (Belgium)

The installation of the van de Graaff accelerator started, and the construction of the building to house it was completed. Construction also started on the buildings to house the linear accelerator and the mass spectrometer.

Contracts

Apart from the work at the Joint Research Center, 133 research contracts were signed (124 in 1961) including six large-scale association contracts.

- U.S.-Euratom Agreement

By the end of 1962 the two partners had engaged \$27 million (\$17 million for execution in Europe and \$10 million in the U.S.) for work in connection with water-cooled reactors; 20 new contracts and 27 renewals were signed during the year. The main subjects of research were nuclear fuels and materials, in particular uranium oxide, the recycling of plutonium, the thermodynamics and hydrodynamics of fluids, and the retreatment of radioactive waste. Another joint interest has been that of 'fog-cooled' reactors.

- high-temperature gas reactors

The construction of 'Dragon' is expected to be completed in December, 1963, three months before the expiry of the 'Dragon' Agreement. It was considered desirable to continue the co-operation on this line of research, and the Agreement has been extended by three years to April 1, 1967. Euratom is bearing 46 per cent (\$32.2 million) of the total cost of \$70 million. Negotiations are under way for Euratom participation under association contract with the BBC/Krupp 'pebble-bed' reactor (AVR) at Jülich, and agreement in principle has been reached on the joint operation of this reactor. Conclusion of a formal agreement is expected in the near future. Along with the operation of the reactor the research program will include joint research and development on the THTR (thorium high-temperature reactor) concept and the study of a 400-500 MWth WHTR. Discussions are under way with the U.S. Atomic Energy Commission and the German Atomic Energy Ministry to examine the possibility of a co-operation agreement and the exchange of information between the THTR and American high-temperature gas reactor projects; negotiations are also in course for closer co-operation in this work with that of the 'Dragon' project. The inauguration of a form of close co-operation between all the high-temperature gas reactor projects in the world can therefore now be regarded as virtually achieved.

- fast reactors

Fast reactor research is proceeding almost wholly under association contract. As a partner in each of the main fast reactor projects, the Euratom Commission will be able to ensure to a large degree, the co-ordination of all

Community research in this sector, the most important item in the Second Research Program. One of these contracts was signed with the French CEA for the joint study, construction, and operation of the 'Rapsodie' experimental reactor and of a critical assembly. Negotiations are under way with the German authorities for association with the work of the Karlsruhe center as a whole, in particular the design of a 100-MWe plant whose construction could start in 1967. During the period to 1965 a whole series of fast plutonium reactors will be studied, along with neutron studies, and the construction of a fast neutron critical assembly is foreseen. A third association contract is under discussion with the Italian CNEN for research centered on the use of the thorium-U233 cycle in a fast sodium-cooled reactor. Lastly, the Ispra center is contributing to this program studies in the field of reactor physics, the re-treatment of irradiated fuels, and sodium.

- materials-testing reactors

The second materials-testing reactor in the service of the Community is the Belgian BR2 at Mol, the subject of a 20-year association contract with Euratom. In January the first irradiation experiments were placed for the 'Dragon' project. During the year a medium activity laboratory entered into service.

- other reactor studies

Negotiations are under way for the extension of the contract covering the KEMA SUSPOP (homogeneous suspension) reactor at Arnhem. The Halden Agreement of the ENEA for the study of a heavy boiling water reactor has been prolonged for a further 18 months to June 30, 1964, in order to complete the work in progress. 'Fog-cooled' reactor studies were also launched.

- fusion

Knowledge of plasma properties is still insufficient for the construction of fusion reactors to be foreseen. Two new association contracts were signed (bringing the total to five) with the Dutch Stichting Fundamenteel Onderzoek van de Materie at Jutphaas and the Kernforschungsanstalt des Landes Nordrhein-Westfalen at Jülich. The existing contracts with the French CEA (Fontenay) and the Italian CNEN (Frascati) were renegotiated for further three-year periods. With these five contracts the network of associations is completed, Euratom participation in all fusion work in the Community is assured, and the Commission is able to co-ordinate all the work undertaken in this sector. Co-ordination is assisted by the formation in February 1962 of a liaison group consisting of physicists from each of the associated laboratories.

- biology

Various contracts were signed during the year with laboratories and university institutes on, for instance, the study of genetic alterations likely to be brought about by radiation. A further association contract was signed, with the Naples Genetics and Biophysics Institute for research into genetics and biophysics. Work continued under the ITAL contract on the application of nuclear techniques to agriculture, and a Joint Mutation Breeding Group was formed bringing together the leading institutes interested.

Training

A total of 257 student trainees were accepted during the year including 10 from non-Community countries. In addition, 80 'qualified trainees' were accepted, and a number were admitted to the power reactor projects in Italy in which Euratom is participating financially.

The French Government has proposed that a fifth establishment of the Joint Research Center be set up at the "Institut national des sciences techniques nucléaires" at Saclay for the advanced training of Community nuclear scientists. This proposal is being studied by the Commission.

OTHER POINTS FROM THE SIXTH GENERAL REPORT

- The Euratom Supply Agency has concluded the first contracts within the framework of the U.S.-Euratom Agreement for the supply of enriched uranium for the SENN reactor. In July, 1962 the Agency signed with the USAEC a contract permitting the lease of enriched uranium from the U.S. for private or national research projects, and 52 kg. of 90%-enriched uranium has been since delivered via the Agency to national centers. The Agency has also obtained 834 kg. of enriched uranium and 4.8 kg. of plutonium for research by Community concerns under contract to Euratom. The Agency is now negotiating with the UKAEA for the supply of plutonium for the first core of 'Rapsodie'.

A large number of contracts for the delivery of small quantities of uranium or thorium were notified to the Agency during the year.

The Agency has undertaken a market survey covering the supply of nuclear materials for the 1963-67 period.

- The Information and Documentation Center expanded its activities: it published 109 scientific and technical reports on the results of Community research, undertook 204 documentary researches, and published regular bulletins such as 'Transatom Bulletin' (6,032 references in 1962). A computer for documentary research is to be installed in 1963.

- The Commission's patent office has dealt with 248 inventions resulting from Community research, of which 117 were in 1962; for 195 of these a preliminary request has been placed in a member country (106 in 1962), 54 of them for the 'Dragon' project. By the end of 1962, the Commission had been informed of the content of 8,785 patent requests (1,342 in 1962) covering 6,312 inventions.

- According to the Security Control regulations, by the end of 1962, 97 declarations had been made in fulfillment of Regulation 7 regarding the technical specifications of equipment and 134 in regard to Regulation 8 on the stocks of materials at mines and their transfers to and from installations (the figures are 83 and 127 for end-February, 1962). Altogether 260 declarations were made on imports and exports of raw and fissile material to and from non-member countries. By the end of 1962, 34 inspections had taken place, 20 in research installations and 14 in industrial. In many cases, national authorities have helped in the organization of the inspections.

- In the application of the basic health and safety standards Belgium and Holland have submitted texts to the Commission. The Commission has made certain comments on these texts which are now in course of revision. In March the French Government decreed that the standards should be in force in French national atomic centers. The Commission published a revised text in July, 1962.

The Commission has carried out studies on the harmonization of radioactivity measuring methods in the air, water and soil, a systematic study of radioactivity in the Rhine basin, and a study (in association with the French CEA) of radiation contamination in the alimentary canal.

- Amendments to the U.S.-Euratom Co-operation Agreement were signed in July. The amendments, which bring a greater degree of flexibility into the Agreement as regards materials supplied, permit the lease, in addition to the purchase, of fissile materials for power reactors constructed under the Agreement, make a part of the 30 tons of enriched uranium originally earmarked for the joint power program available to Euratom for power reactors or research outside the scope of the Agreement, permit the re-export of U.S.-supplied fissile materials after fabrication, and allow U.S.-supplied fuel to undergo chemical re-treatment in Community plants.

"Euratom has now acquired sufficient experience and weight for the U.S.-Euratom Agreement to be tantamount to an Atlantic partnership in the nuclear field," the report states.

- A Co-operation Agreement with Argentina was signed.

- Seven countries - Ivory Coast, Portugal, Spain, Australia, Greece, Ireland and Upper Volta--were added to the list of those with accredited missions to Euratom, bringing the total to 18.

- Ivory Coast requested Euratom aid in the study of the use of radioisotopes. The Commission responded favorably.