european
BACKGROUND INFORMATION
community

EUROPEAN COMMUNITY INFORMATION SERVICE

2100 M Street NW, Washington DC 20037 Telephone (202) 872-8350
New York Office: 277 Park Avenue, New York NY 10017 Telephone (212) 371-3804

BACKGROUND NOTE

No. 22/1976

May 12, 1976

EURATOM AND SWEDEN SIGN COOPERATION AGREEMENT ON THERMONUCLEAR FUSION RESEARCH

The European Atomic Energy Community (Euratom) and Sweden have signed an agreement for cooperation in the field of controlled thermonuclear fusion and plasma physics. This is the first time a non-member of the Community has been associated with Euratom's research in this area.

With 17 years of research behind it, Euratom's fusion and plasma physics program is one of the world's best established. Research has been done in a series of five-year programs. The latest began this year.

Fusion and plasma physics was selected for a joint effort because it is one type of research that offers participants enough incentives to overcome national rivalries in the interests of common achievement. It is too expensive for any one participant to finance, and it is a vital area of advanced technology in the future. Without a common venture, the Nine would be shut out of this new technology.

How the Community Program Works

The Community's thermonuclear fusion program works through association contracts with member countries' research organizations. The signature of the cooperation agreement with Sweden has opened the way for an association contract with the Swedish National Board for Energy Source Development.

In funding, the Commission contributes about 25 per cent of each association's general expenditures and the individual participating countries pay the remainder. The Commission also supports capital investments to build large experiments of special interest to the entire Community, raising its appropriation to about 45 per cent for specific projects being done in associated laboratories. This means that each participating country has the major interest in its own operations, but the Commission can help integrate their programs to avoid duplication of effort.

So far, laboratory experiments on fusion devices have been small enough and cheap enough to be built by national laboratories. However, the next major step

in the European fusion program, the joint European torus (JET), will move fusion research into big science. (The torus is the "ring" where the plasma is magnetically confined and where fusion takes place.) The JET will be built at a site still to be chosen. A 108 million unit of account (UA) budget has been proposed for the Community's contribution to the JET in 1976-80, 80 per cent of its total cost. (One UA equals $1.20635.)

For other fusion research, the Community will provide UA 124 million in 1976-80. Adding national contributions in 1976-80 raises the total European fusion program budget to about UA 550 million, (including the JET).

Some Comparisons with US Fusion Research

The Community's five-year plan dovetails neatly with the US program; they are complementary and fill each other's gaps. Exchange of information takes place mainly within the International Atomic Energy Agency in Paris. Excluding the US laser effort, the US program is still a little larger than the European one, but is comparable to it for the first two years. Afterwards, the United States plans to intensify its efforts so that a prototype reactor can be built as fast as possible.

Europe plans to wait until the next two years of research have clarified the prospects for fusion power before deciding whether or not to speed up development efforts for a fusion reactor.

Fission vs. Fusion

Nuclear fission is the process now used in nuclear generators. In this process, energy is obtained by splitting large nuclei into smaller nuclei by the impact of neutrons.

Nuclear fusion is a process still in the experimental stages. It amounts to finding a peaceful use for the technology used in the hydrogen bomb. In this process energy is obtained by joining light nuclei into a heavier one.

Nuclear fusion offers a number of advantages over nuclear fission. In fusion, the amount of fuel in the reactor zone is so small as to rule out the chance of a nuclear runaway. Its main fuels -- deuterium (obtained from water) and lithium are plentiful and can be processed on site, eliminating the danger of a nuclear accident during shipment.