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21 August 1985

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

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WORLDWIDE REPORT

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CONTENTS

ASIA

HONG KONG

Agreement To Finance Nuclear Power Plant Signed
(Hong Kong HONGKONG STANDARD, 13 Jun 85) 1

JAPAN

Agreement Reached With PRC on Nuclear Power Cooperation
(Tokyo KYODO, 5 Jul 85) 2

Research Commences on High-Conversion Nuclear Reactor
(Tokyo KYODO, 17 Jun 85) 3

Briefs
Nuclear Fusion Data Link With U.S. 4
PRC Nuclear Project Bids 4

PEOPLE'S REPUBLIC OF CHINA

WEN WEI PO Urges Sino-U.S. Nuclear Cooperation
(Editorial; Hong Kong WEN WEI PO, 30 Jun 85) 5

Contract Readied To Monitor Daya Bay Project
(Hong Kong SOUTH CHINA MORNING POST, 24 Jun 85) 7

Briefs
PRC-Japan Nuclear Energy Accord 8

CANADA

Restrictions on Sale of Tritium to U.S. Studied
(Bill Walker; Toronto THE TORONTO STAR, 13 Jun 85) 9

Groups Protest Nuclear Testing, Warships
(Toronto THE TORONTO STAR, 10 Jun 85; Vancouver
THE SUN, 17 Jun 85) 10

Halifax Women's Peace Conference, by Sarah Jane Growe 10
Esquimalt Base Picketing 11

Nuclear Cooperation Agreement Signed With Turkey
(Ottawa THE CITIZEN, 19 Jun 85) 12

Ontario Hydro Declines Douglas Point Station Deal
(Ottawa THE CITIZEN, 20 Jun 85) 13

Briefs
Ontario Hydro Repair Costs 14

EAST EUROPE

INTERNATIONAL AFFAIRS

Nuclear Energy Development, CEMA Cooperation Viewed
(Prague SVET HOSPODARSTVI, No 62, 1985) 15

BULGARIA

Kozloduy Nuclear Station Short of Building Materials, Equipment
(Sofia, BULGARSKI PROFSOYUZI, No 4, 1985; Sofia,
RABOTNICHESKO DELO, 14 Jun 85) 27

Explanations for Supply Problems, by Angel Milev 27
Blame Placed for Non-Fulfillment, by Iliya Borisov 30

Kozloduy Nuclear Units' Operation Exceed All CEMA Records
(Iliya Borisov; Sofia RABOTNICHESKO DELO, 23 Jun 85) 33

New Scientific-Technical Methods Developed at Nuclear Power Unit
(Nevena Markova; Sofia RUDNICHAR, 13 Jun 85) 35

GERMAN DEMOCRATIC REPUBLIC

Review of 30-Year Development of Nuclear Research, Technology
(K. Rambusch; East Berlin KERNENERGIE, No 5, May 85) 37

LATIN AMERICA

INTER-AMERICAN AFFAIRS

Briefs
Nuclear Tests Denounced 42

ARGENTINA

Costantini: Nuclear Policy Is Not in Crisis
(Buenos Aires CLARIN, 2 Jun 85) 43

Bribery Charge Related to Nuclear Reactor Said Confirmed
(Buenos Aires CLARIN, 13 Jun 85) 45

'Small' Nuclear Power Center Planned in Cordoba
(Buenos Aires TELAM, 28 Jul 85) 47

Briefs
CNEA Resignations 48
Lapena on Nuclear Energy 48
Nuclear Scientists' Exodus Denied 49

BRAZIL

Commentator Views Reagan-Gorbachev Meeting
(Newton Carlos; Sao Paulo Radio Bandeirantes Network,
10 Jul 85) 50

Pugwash Meeting Cables Sarney, Reagan, Gorbachev
(Rio de Janeiro O GLOBO, 10 Jul 85) 51

FRG Minister Urges Construction of Second Nuclear Plant
(Hamburg DPA, 26 Jun 85) 52

Government To Review Nuclear Agreement With FRG
(Rio de Janeiro O GLOBO, 12 Jul 85) 53

Setubal Questions USSR's Nuclear Test Suspension
(Paris AFP, 30 Jul 85) 54

Uranium To Be Enriched by Jet-Nozzle Process by 1989
(Sao Paulo O ESTADO DE SAO PAULO, 24 Jul 85) 55

Annual Report of IPT of Sao Paulo
(Sau Paulo GAZETA MERCANTIL, 22 Apr 85) 57

Sarney on FRG Accord, Argentina's Nuclear Intentions
(Jose Sarney; Brasilia Domestic Service, 2 Jul 85) 69

Goldemberg Cites Causes, Solutions to Program's Problems
(Jose Goldemberg; Sao Paulo O ESTADO DE SAO PAULO,
17 Jul 85) 71

NUCLEBRAS Head Says Program's Failure Due To Lack of Funds
(Rio de Janeiro O GLOBO, 27 Jun 85; Sao Paulo,
O ESTADO DE SAO PAULO, 28 Jun 85) 75

Uncertainty Marks Nuclear Program 75
NUCLEBRAS Could Be Closed, Editorial 76

NUCLEBRAS Technicians Doubt Angra III Will Be Halted
(Sao Paulo O ESTADO DE SAO PAULO, 18 Jun 85) 78

Chaves Defends Angra III Construction; Editorial Comment
(Sao Paulo O ESTADO DE SAO PAULO, 21 Jul 85) 80

Ministry Cites Infrastructure 80
Doubts Expressed About Program, Editorial 81

Amendment Banning Production of Weapons To Be Proposed
(Sao Paulo FOLHA DE SAO PAULO, 17 Jun 85) 83

Briefs
Nuclear Agreement Reexamination 84
Nuclear Program Reassessment 84
Japanese-Brazilian Agreement 84
Nuclear Program Commission 84

CHILE

Briefs
'No Plans for Atomic Bombs' 85

NEAR EAST/SOUTH ASIA

EGYPT

Briefs
Uranium, Thorium in Al-Buhayrah 86

INDIA

Decision on Nonproliferation Pact Explained to IAEA
(Bombay THE TIMES OF INDIA, 14 Jun 85) 87

Commentary Views Pakistan's Nuclear Program, Intentions
(Editorial; Delhi THE HINDUSTAN TIMES, 15 Jul 85) 88

Commentator Writes on Pakistan Nuclear Capacity
(R. R. Subramanian; New Delhi PATRIOT, 20 Jun 85) 90

Uranium Reserves Established at 73,000 Tons
(Calcutta THE TELEGRAPH, 8 Jul 85) 92

Expansion Underway at Nuclear Fuel Complex
(Madras THE HINDU, 6 Jul 85) 93

Briefs
Indo-Cuban Nuclear Energy Pact 95

PAKISTAN

Commentary Views U.S.-China Accord
(Editorial; Karachi MASHRIQ, 27 Jul 85) 96

SUB-SAHARAN AFRICA

SOUTH AFRICA

AEC Head on Operation of Nuclear Industry
(Wynand de Villiers Interview; Johannesburg BUSINESS DAY, 12 Jul 85) 97

SUDAN

Briefs
Nuclear Waste Dumping Ban Urged 99

USSR

Briefs
Nuclear Safety Consultants With Spain 100

WEST EUROPE

EUROPEAN AFFAIRS

Euratom to Tighten Uranium Sales to Israel
(Rome ANSA, 12 Jul 85) 101

Future of Breeder Reactors in Europe Discussed
(Paris AFP SCIENCES, 20 Jun 85) 102

EC Projects for Storing Radioactive Waste
(Rudolf Weber; Vienna INDUSTRIE, 12 Jun 85) 104

Briefs
Resolution on Nuclear Energy 108

FRANCE

Nuclear Plant Operation Report for May 1985
(Paris AFP SCIENCES, 13 Jun 85) 109

Plans for Superphenix-2 Described, Improved Design
(Paris AFP SCIENCES, 6 Jun 85) 111

Vibrations at Superphenix Require Modifications
(Paris AFP SCIENCES, 13 Jun 85) 114

Vibrations Found in New 1300 MW Reactors
(Paris AFP SCIENCES, 10 Jun 85) 117

SIPRI Notes Secret Report on Geological Conditions
(Paris AFP SCIENCES, 10 Jun 85) 119

COGEMA Cites Laser in Competition for Enrichment Contracts
(Paris AFP SCIENCES, 30 May 85) 120

'Inflexible' Features Noted, Next Generation Planned
(Paris AFP SCIENCES, 30 May 85) 122

Plutonium Addition to PWR's Planned for 1987
(Paris AFP SCIENCES, 13 Jun 85) 123

Briefs
Enriched Uranium for India 124
Enriched Uranium for Switzerland 124
Fessenheim Reports Good Year 124
Civaux Construction To Begin 125
SGN-FRG Reprocessing Plant 125
Chinon-A2 Shut Down Permanently 125

NETHERLANDS

U.S. Concessions in Geneva Needed for Nonproliferation
(An Salomonson; Rotterdam NRC HANDELSBLAD, 1 Jul 85) 126

Nuclear Technology Smuggler Jailed
(The Hague ANP NEWS BULLETIN, 3 Jul 85) 129

SPAIN

Asco II Power Plant Sanctioned for Safety Infractions
(Madrid MERCADO, 17 May 85) 130

Infractions at Almaraz Power Plant; Sabotage Possible
(Jesus Rivases; Madrid TIEMPO, 3 Jun 85)..... 132

UNITED KINGDOM

UK Spent Uranium Sold to Israel by Luxembourg Firm
(David Adamson; London THE DAILY TELEGRAPH, 12 Jun 85) ... 137

Party Leader Owen Calls for Nuclear Pact With France
(Nicholas Comfort; London THE DAILY TELEGRAPH, 22 Jun 85). 138

HONG KONG

AGREEMENT TO FINANCE NUCLEAR POWER PLANT SIGNED

Hong Kong HONGKONG STANDARD in English 13 Jun 85 pp 1, 14

[Text]

THE Hongkong Nuclear Investment Company Limited (HKNIC) signed an agreement yesterday for the issue of bills of exchange by tender worth $500 million.

The money raised under the facility will be used to provide the greater part of HKNIC's equity investment in the joint venture company for building the Daya Bay nuclear power plant.

The issue is guaranteed by the Hongkong government, arranged by Schroders Asia Ltd and fully underwritten by the Hongkong and Shanghai Banking Corporation, Standard Chartered Bank and Schroders Asia Limited.

The remaining $300 million, which makes the total equity of $800 million (US$100 million), will be provided by China Light and Power Company as the holding company.

Following the signing ceremony the chairman of the HKNIC, Mr William Stones, said: "With the government's guarantee and the granting by the Financial Secretary of Specified Liquid Asset status, the bills drawn under the facility will be unique in Hongkong."

The commercial loans will mature in 1991 and there is no pre-set interest rate.

However, there will be a maximum margin over the Hongkong inter-bank rate, but the actual rate will be subject to the tenders, Mr Stones said.

The tender panel comprises BA Asia Ltd, BT Asia Ltd, Banque Indosuez, Barclays Bank PLC, Chase Manhattan Asia Ltd, Citicorp International Ltd, Jardine Fleming and Co Ltd, Grindlays Asia Ltd, Lloyds Bank International Ltd, Manufacturers Hanover Asia Ltd, Paribas Asia Ltd, Sanwa International Finance Ltd, Schroders Asia Ltd, Standard Chartered Asia Ltd and Wardley Ltd.

Meanwhile, Mr Stones said negotiations on the contract with the French nuclear manufacturer, Framatome, and Britain's General Electric Company to construct a 1,800 megawatt nuclear plant will start between June 20 and 25.

Negotiations will also take place at that time with another party, Electricite de France, which will be responsible for the civil project services.

Mr Stones said a lot of work had been done on studying the technical aspects and the forthcoming negotiations will centre on commercial matters.

Mr Stones said he hoped to sign a letter of intent, at the right price, with these companies by the end of August. It will then go to the board for authorisation so that work can proceed before the end of this year.

This schedule aims to have the first 900-megawatt reactor turbine running by the end of 1991.

Asked what would happen if a fair price cannot be negotiated with these companies, Mr Stones said: "Supposing in the end we really find ourselves in a situation where we could not negotiate a price which we want, which we believe to be a fair price not just from our point of view but also from theirs, there's no point getting a price that is unfair to them or, in fact, to us."

But Mr Stones stressed that the time schedule and time element were important factors in this kind of massive project.

He added that expertise would be given by a consulting firm — Electricite de France — a utility company in France which has already got about 39 nuclear reactors in service with another 15 to 20 under construction.

Mr Stones said the regulatory system set up in China was similar to that in France.

CSO: 5150/0035

JAPAN

AGREEMENT REACHED WITH PRC ON NUCLEAR POWER COOPERATION

OW050955 Tokyo KYODO in English 0945 GMT 5 Jul 85

[Text] Beijing, July 5 KYODO -- Japan and China reached a provisional agreement here Friday on nuclear power cooperation, opening the way for Japan's export of atomic power plant equipment to its communist neighbor.

Details of the agreement, a product of bilateral negotiations opened in October 1983, were not released pending official signing of the accord, probably at a bilateral ministerial meeting set for Tokyo later this month. But chief Japanese negotiator Yoshifumi Matsuda, director general of the Foreign Ministry's Office of Science and Technology Affairs, said the agreement includes provisions ensuring peaceful use of nuclear power and the related technology to be exported from Japan.

China had objected to a proposed provision allowing Japan to call for the return of equipment and radioactive materials in the event of a serious violation of the agreement on the Chinese side.

Speaking to reporters, Matsuda said both Japan and China had made concessions to reach agreement on the content of the provision. He did not elaborate. He said China has so far concluded similar agreements with Italy, France, West Germany, Brazil, Argentina, Belgium and Britain. But only the agreements with Brazil and Argentina contain provisions concerning peaceful use of nuclear power and radioactive materials, Matsuda added. He said Japanese negotiators won Chinese agreement on the provision after telling the Chinese officials that Japanese people are very sensitive about the issue because of the 1945 atom bomb holocaust in Hiroshima and Nagasaki.

China was represented in the five-day negotiations by Jia Weiwen, a member of the State Scientific and Technological Commission. China plans to build about 20 nuclear power plants with combined output of 10 million kilowatts through the year 2000, starting with one at Qinshan, central China.

CSO: 5160/4

RESEARCH COMMENCES ON HIGH-CONVERSION NUCLEAR REACTOR

OW171317 Tokyo KYODO in English 1149 GMT 17 Jul 85

[Text] Tokyo, July 17 KYODO -- Japan has started research on a light water reactor that will be able to produce about the same amount of nuclear fuel as it has used, it was revealed Wednesday. The governmental Japan Atomic Energy Research Institute said it hopes to complete research and development on the reactor by about 1995 so that it can be put to practical use by about 2000. The new reactor is called a high-conversion light water reactor (HCLWR).

According to the institute, there has been such a great delay in the development of a fast breeder reactor that the chances of it being put to use in the near future are slim. Kansai Electric Power Co., which is Japan's main user of the pressurized water reactor (PWR), on which research is being based, and Mitsubishi Heavy Industries Ltd., builder of the PWR, are showing strong interest in the HCLWR research. The two companies also intend to work to develop their own new reactor -- a high-conversion PWR -- while seeking the cooperation of the institute.

The Science and Technology Agency, recognizing importance of the HCLWR, secured a 40 million yen budget for the project for fiscal 1985 and intends to seek a 370 million appropriation for fiscal 1986. The institute said that the HCLWR increases the density of fuel-rod placement in light water reactors, now in wide use in Japan, in order to reduce the amount of water running between fuel rods, and cuts the ratio of neutrons -- jumping out in nuclear fission -- absorbed by water so that uranium 238, which is nonfissionable, will absorb much more neutrons and thus be converted into plutonium 239, which is quite fissile. The speed of neutrons in the projected reactor will be much greater than that of a common light water reactor, researchers said.

CSO: 5160/9

BRIEFS

NUCLEAR FUSION DATA LINK WITH U.S.--Tokyo, June 5 KYODO--Leading nuclear fusion research organizations from Japan and the U.S. plan to develop a package of codes capable of analyzing and evaluating each other's data using their own supercomputers. The plan, aimed at promoting bilateral cooperation in the scientific field, is planned for completion within a year. The Plasma Institute at Nagoya University, central Japan, will launch a test of software for file transfers from July 1 following over five years of tests on programming instructions, Hideo Ikegami, a professor at the institute said Wednesday. The institute's partner in the project is the Lawrence Rivermore National Laboratory in California, which provides a nationwide data exchange network, called the Magnetic Fusion Energy Network (MFENET), connecting five major U.S. governmental institutes via a Cray-1 supercomputer, Ikegami said. Meanwhile, the Japanese institute has installed Fujitsu Ltd's VP-100 supercomputer, which connects terminals at the country's nuclear energy research centers, he said. "The computer codes to be developed, will enable U.S. and Japanese researchers to check each other's study results faster," the professor said. [Text] [Tokyo KYODO in English 0338 GMT 5 Jun 85]

PRC NUCLEAR PROJECT BIDS--Hong Kong, 21 Jun (KYODO)--Three Japanese construction companies--Taisei Corp., Maeda Construction Co. and Shimizu Construction Co.--have been made specified tenderers for a nuclear power plant project in the Shenzhen Special Zone, Guangdong Province, China, reliable informed sources here disclosed Friday. The Japanese construction companies, which are members of consortium with French and Chinese firms, are on a list of six consortiums invited to bid for the project, worth about 30 billion Hong Kong dollars, the sources said. The nuclear power plant will have two reactors with a total capacity of 1.8 million kilowatts located along Dayan Wan, Shenzhen City. Tenders will be submitted on 30 August, they said. [Text] [Tokyo KYODO in English 0304 GMT 21 Jun 85 OW]

CSO: 5160/6

PEOPLE'S REPUBLIC OF CHINA

WEN WEI PO URGES SINO-U.S. NUCLEAR COOPERATION

HK300544 Hong Kong WEN WEI PO in Chinese 30 Jun 85 p 2

[Editorial: "Eliminate the Obstacles to Sino-U.S. Nuclear Energy Cooperation"]

[Text] On the eve of President Li Xiannian's visit to the United States, the United States sent a 6-person delegation headed by Richard Kennedy, ambassordor-at-large, to Beijing to discuss the issue of nuclear energy cooperation. According to U.S. officials, great progress was made in the talks. However, China's XINHUA NEWS AGENCY merely said that they held "profitable talks."

News from Washington says: The United States and China may formally sign an agreement on nuclear energy cooperation when Li Xiannian visits the United States in July.

It is known to all that the United States is the one to be blamed for the delay in the formal signing of the nuclear energy cooperation agreement. In late April, 1984, when President Reagan visited China, he initialed the agreement on nuclear energy cooperation. However, the United States kept procrastinating on the presentation of the agreement to Congress for examination and approval. On 16 April this year, that means 14 months after Reagan's visit, the U.S. House of Representatives approved the amendment to the "export control regulations," thus making the examination and approval of the agreement on nuclear energy cooperation even more complicated and harsh. The new amendment empowers Congress to veto nuclear energy cooperation. In addition, it prolongs the examination time from 60 days to 90 days and makes hearings a must. According to the old regulations, Congress would have almost no other alternative but to approve the Sino-U.S. nuclear energy cooperation agreement which was presented to Congress for approval by the White House.

On the issue of transfer of advanced technology to China, because of the pressure put on the Coordinating Committee for Export Control by the United States, the latter has lifted its restrictions on the export of microcomputers to China. However, it has extended the embargo to the export of superconducting materials, robots, gas turbine technology, and computer software. This policy is in fact protectionism in the area of technology transfer.

This policy is not in the interest of U.S. development of its foreign trade. U.S. financial groups react to this differently. U.S. nuclear industry is experiencing a crisis of a rapidly shrinking market. In the next 10 years, if the United States can expand its nuclear energy market in China, its nuclear energy industry will be able to receive orders valued at about $10 billion and to increase the number of its employees

by 20,000 to 50,000. Thus, the industry hopes the White House will sign the Sino-U.S. agreement on nuclear energy cooperation as soon as possible. Ambassador Kennedy's visit to China indicates that in the United States, people are increasingly urging the signing of the agreement on nuclear energy cooperation.

Some congressmen are of the opinion that it is necessary to ask China to provide a written guarantee for U.S. supervision and control in order to prevent the transfer of nuclear technology to other countries. China is a member of IAEA and has consented to supervision. On many occasions, various Chinese leaders have openly announced that "China does not favor nuclear proliferation; it does not, and will not, help any non-nuclear country develop nuclear weapons."

Without the help of foreign nuclear technologies, China produced A-bombs long ago. China could have profiferated military nuclear technology long ago. However, so far China has not transferred its nuclear weapons or technology to other countries. China advocates world peace and nuclear disarmament. That is its firm principle. If one has doubts as to whether or not China will proliferate nuclear technology, one is blind to the fact. In the United States, there are many far-sighted people.

They can, by staying away from protectionism, facilitate the development of Sino-U.S. relations. The United States should discard some outmoded political prejudices and eliminate obstacles to the transfer of technology. China and the United States are at different stages of technological and industrial development. Cooperation can only benefit the U.S. economy and world peace.

CSO: 5100/4134

PEOPLE'S REPUBLIC OF CHINA

CONTRACT READIED TO MONITOR DAYA BAY PROJECT

HK240419 Hong Kong SOUTH CHINA MORNING POST in English 24 Jun 85 p 19

[Text] A $2 million contract to monitor the Daya Bay nuclear power plant is expected to be signed with a British consultancy early next month.

It is understood the Economic Service Branch is drafting an agreement which will be completed within the next week or so, and which will then be forwarded to the United Kingdom Atomic Energy Authority for comments before the signing.

The contract, which includes five elements, will be completed by July 1987 and will involve periodic reports.

These will include advice on the plant's radioactive monitoring programme, accident assessment, contingency plans and publicity matter.

In addition, about five officials from the Royal Observatory and the Medical and Health Department will be trained in the UK in such matters as radioactivity protection and practical laboratory experience.

CSO: 5100/4134

BRIEFS

PRC-JAPAN NUCLEAR ENERGY ACCORD--Beijing, 5 Jul (XINHUA)--China and Japan initialled an agreement on cooperation in peaceful use of nuclear energy here today. The signatories to the document where Jia Weiwen, leader of the Chinese delegation to the talks on the agreement, and Hirofumi Mazuda, leader of the Japanese delegation. The fifth round of talks on the agreement began July 1 here and proceeded in a friendly atmosphere. [Text] [Beijing XINHUA in English 1622 GMT 5 Jul 85]

CSO: 5100/4134

CANADA

RESTRICTIONS ON SALE OF TRITIUM TO U.S. STUDIED

Toronto THE TORONTO STAR in English 13 Jun 85 p A13

[Article by Bill Walker]

[Text] The external affairs department has launched a study to see what restrictions should be imposed on Ontario Hydro's future sales of radioactive tritium — which can be used to produce nuclear warheads — to the United States.

There is great concern about how the U.S. government may use tritium purchased from Hydro, external affairs spokesman Rejane Dodd said from Ottawa yesterday.

And the Atomic Energy Control Board, the federal watchdog agency for nuclear energy, is worried about how the Americans will guarantee that the tritium will be used for peaceful purposes, board spokesman Hugh Spence told The Star.

The board "is not certain what specifics will be required to be written in a agreement" to sell tritium to the U.S., Spence said.

External affairs and the board must approve jointly any sales to the U.S. by Hydro.

Tritium — a byproduct of nuclear reactors — is a radioactive isotope of hydrogen that sells for up to $16 million a kilogram. It can be used for peaceful purposes, such as in medical research or in glowing airline signal lights, or it can become a key ingredient in nuclear warheads.

No tritium has yet been sold by Hydro, but a $100 million tritium recovery plant is to be completed at Hydro's Darlington nuclear station by 1987.

Canada and the U.S. have a longstanding nuclear co-operation agreement. It says materials sold by Canada will not be used for nuclear devices, for research into those devices, or for any military purposes, Spence said.

But while the agreement covers current sales of substances such as uranium, tritium is not mentioned because there have been no sales to date.

One fear, expressed by New Democrat MPP Bud Wildman (Algoma) in the Legislature this week, is that sales of tritium from Ontario to the U.S. will free up American sources of the substance for use in nuclear weapons.

Liberal Eddie Sargent (Grey-Bruce) raised the issue in the Legislature this week when he asked the Progressive Conservative government whether Hydro tritium would be used in some role in the U.S. Star Wars anti-ballistic missile defence system.

"Tritium boosts the yield of an atom bomb about 1,000 times and is essential to the manufacture of the powerful warheads," Sargent said.

CSO: 5120/20

GROUPS PROTEST NUCLEAR TESTING, WARSHIPS

Halifax Women's Peace Conference

Toronto THE TORONTO STAR in English 10 Jun 85 pp A1, A16

[Article by Sarah Jane Growe]

[Text] HALIFAX — Women at an international peace conference have demanded that Canada and the United Nations press for a worldwide ban on nuclear tests.

The 350 delegates wrapped up the five-day conference yesterday by sending the demand for a treaty banning such tests to the Canadian government and the U.N.

The conference also produced recommendations opposing military activity in space and weapons of mass destruction, and supporting Nicaragua.

A report from the meeting was given to Quebec Progressive Conservative MP Monique Landry, representing the federal secretary of state's department. She is to take the recommendations to the federal government and to a special U.N. session in Kenya next month.

Avoid controversy

"Militarism is an addiction that distorts human development, causing worldwide poverty, starvation, pollution, repression, torture and death," the conference document says.

The delegates — from 33 countries, although more than 200 were from Canada — also cited Nicaragua as "the model of a new kind of society" and "a symbol of hope which must be allowed to live."

But the women, who met at Mount St. Vincent University, did not include a number of more controversial resolutions, despite pleas from Third World participants.

Instead, those recommendations were relegated to a list of about 50 "statements of affirmation," including:

- The release of political prisoners in the Philippines, South Africa and the United Kingdom;
- An end to American aid to El Salvador;
- An end to the U.S. economic blockade of Nicaragua;
- Laws to end Canadian investment in South Africa;
- Cancellation of Canada's cruise missile testing agreement with the U.S.

The "statements of affirmation" were not given formally to Landry. But delegates from the women's conference also are going to the U.N. meeting in Kenya, and they will be free to raise the "statements" there.

"I have had experience in these things," said Joanna Miller, a member of a committee advising Canada's delegation to the U.N. General Assembly. "We cannot submit a grab-bag of ill-conceived proposals."

"The people of the Third World have paid the price with their lives for these proposals," said Cana-

dian delegate Nonny McLaughlin from Quebec. "If we don't support them, we should not have invited them."

In addition, ideas concerning the Middle East were considered so controversial that they were set aside for discussion at a second international women's peace conference that was proposed for Mideast issues only.

Those ideas included support for an independent Palestinian state, return to Israel's pre-1967 boundaries, condemnation of West Bank settlements, and a Geneva conference on the Mideast that would include the Palestine Liberation Organization.

Esquimalt Base Picketing

Vancouver THE SUN in English 17 Jun 85 p A8

[Text] **Special to The Sun**

ESQUIMALT — Military police kept watch Sunday on a small group of protesters demonstrating against visits here by U.S. warships carrying nuclear weapons.

Protest spokesman Phil Esmonde said most Canadians don't know nuclear-armed warships routinely visit bases in Canada and their silence is taken to mean "public compliance with the arms buildup — especially the deployment of sea-launched cruise missiles.

"But we don't think that's the case," Esmonde said in an interview during a 1½-hour protest by about 50 placard-carrying protesters in front of the gates at Canadian Forces Base Esquimalt.

Base information officer Maj. Norbert Cyr refused comment on the protest and on the issue of nuclear-armed U.S. warships visiting the base.

But he said it is national defence policy to "neither confirm nor deny" the existence of nuclear weapons aboard visiting American warships.

Esmonde said that is tantamount to an admission that the government is aware nuclear-armed warships visit Canada regularly.

He said there are U.S. warships at the base about 25 per cent of the time.

A protective ring of connected buoys prevented a small peace flotilla of powered sailboats from moving too close to Canadian warships and a U.S. submarine moored in the harbor.

The demonstration, staged by the Victoria Disarmament Group, was part of an international weekend of protest against deployment of sea-launched cruise missiles by the U.S. and the Soviet Union, Esmonde said.

Cruise missiles pose a particular problem to disarmament talks because they can be armed with either conventional or nuclear warheads, Esmonde said.

Nuclear verification is "virtually impossible under those conditions" and leads to increased mistrust about the number of nuclear weapons each side has, he said.

CSO: 5120/20

NUCLEAR COOPERATION AGREEMENT SIGNED WITH TURKEY

Ottawa THE CITIZEN in English 19 Jun 85 p D7

[Text]

The Canadian Press

Canada signed a nuclear co-operation agreement Tuesday with Turkey, taking a halting step toward this country's first foreign reactor sale in five years.

The agreement, which lays the groundwork for future deals in such areas as reactor construction, uranium supply, use of nuclear technology in health, farming and industry, and exchange of experts and technical training, was signed in Ankara by Canadian Ambassador Gilles Mathieu and Turkish Foreign Minister Yahit Halefoglu.

The foundation of the 15-year accord is a Turkish agreement that nuclear supplies and facilities will not be used to make weapons and that it will abide by the Nuclear Non-Proliferation Treaty and open its installations to inspectors from the International Atomic Energy Agency.

While the agreement "envisages co-operation in such areas as the provision of Candu reactors," still to come is the most important decision — whether the Canadian government will give its financial backing to a reactor deal given the unusual terms the Turkish government has proposed.

Atomic Energy of Canada Ltd., the Crown corporation that designs and sells the Candu power reactor, has basically won the bidding for a $1-billion, 600-megawatt station on Turkey's Mediterranean coast.

But the Turkish government wants AECL to own and operate the reactor for 15 years, recovering the costs of constructing the power station from electricity sales.

AECL has set up a consortium with British and Turkish partners to run the plant at Akkuyu. AECL would hold a controlling 60-percent interest in the consortium.

The government will be asked to provide either export financing through the Export Development Corp. or insure the consortium against any risks inherent in owning a nuclear power plant in a foreign country.

Steve Probyn, Energy Minister Pat Carney's policy adviser for nuclear issues, recently travelled to Turkey to discuss the deal.

Selling a Candu to Turkey would create about 43,000 person-years of employment in the hard-pressed Canadian nuclear industry. (A person-year is government jargon for the equivalent of a full-time job for one person for a year — or, for example, jobs for two people for six months.)

Work is still being done on two power stations sold in 1980 to Romania and four units being built by Ontario Hydro at Darlington, east of Toronto. But no other work is on the order books.

The government has still not officially seen the financing proposal from AECL, and it is understood that a decision is still some time off. The Turkish deal is the first major decision facing the Conservative government in its policy toward the Canadian nuclear industry.

Don Douglas, general manager of the Organization of Candu Industries, said the industry needs the work that would come from the Turkish deal.

But because of the risks posed by the Turkish proposal, industry spokesmen say that a negative government decision will not necessarily call into question whether the federal government still supports the Candu reactor and the industry that has grown up around it.

"It's really a buyers' market when one can contemplate this kind of thing," Douglas said.

The industry, having won the bid, wants to see the project go ahead "but we're business people too and we realize that the deal has risks," said Hal Dickout, vice-president of power systems for Canadian General Electric in Peterborough.

CSO: 5120/20

CANADA

ONTARIO HYDRO DECLINES DOUGLAS POINT STATION DEAL

Ottawa THE CITIZEN in English 20 Jun 85 p A18

[Text] TORONTO (CP) — An $81.7-million nuclear power plant opened in 1967 is not worth taking over even if Ontario Hydro did it for a token dollar, says a study by the provincial utility.

Atomic Energy of Canada Ltd., a federal Crown agency, built the 200-megawatt Douglas Point generating station near Kincardine and Ontario Hydro operated it under an agreement designed to reimburse AECL for its power production.

But the plant never produced power cheaply and consistently enough to offset the relatively high capital cost and Atomic Energy decided to cut its losses by closing the station in May last year.

When plans for the closing were announced, Hydro said it would study the possibility of taking over the plant. A preliminary report recommended against such a move at least until more was known about its conditions.

New documents submitted to an Ontario Energy Board rate hearing show the Hydro study team found the station needed "major capital expenditures, comparable to the cost of a new fossil plant," including complete replacement of the reactor's pressure tubes. Estimates for the work ranged from $120 million to $230 million in 1984 dollars.

The report said if power demands rise as expected, the plant isn't worth a $1 takeover in the long run. The long-term cost of adding the plant to Hydro's generating system would range from $86 million to $157 million in 1984 dollars depending on whether it was mothballed or immediately overhauled, the report said.

The only circumstance under which the plant would be worth even a nominal $1 to Hydro would be in a period of unexpectedly high growth in power demands. Then, operation of a rehabilitated Douglas Point station would eventually save the giant utility $35 million to $40 million, assuming the plant was back in service "before the mid-1990s," the report said.

"Due to the probable loss under expected or lower load growth, the relatively small potential gains under a higher load growth, and large uncertainties, it is not a reasonable business risk to assume responsibility for the reactor now or to pay AECL to maintain the reactor in a mothballed state to permit future operation," the documents said.

The report included a prediction that it will cost the federal agency between $60 million and $125 million to "decommission" the station, a process the utility says will extend over 30 to 35 years.

CSO: 5120/20

CANADA

BRIEFS

ONTARIO HYDRO REPAIR COSTS--Ontario Hydro expects the cost of replacing nearly 800 pressure tubes in two Pickering generating station nuclear reactors to be double an initial $250-million estimate. In a written submission to the Ontario Energy Board, Hydro said a revised estimate of $500 million was approved by the utility's board of directors last October. The $500 million is in addition to about $450 million in extra coal purchases Hydro expects to make during the three-year retubing period. Hydro said the doubled cost estimate was a result of a lack of time in preparing preliminary estimates. [Text] [Windsor THE WINDSOR STAR in English 19 Jun 85 p A10]

CSO: 5120/20

NUCLEAR ENERGY DEVELOPMENT, CEMA COOPERATION VIEWED

Prague SVET HOSPODARSTVI in Czech Supplement No 62, 1985 pp 1-4

[Unattributed article: Priorities in R&D Cooperation Among CEMA Member Countries: Nuclear Power]

[Text] The executive level economic conference of the CEMA member countries which was held in June last year in Moscow represented an important milestone in the development of the relations among the member countries of the community and further improved socialist economic integration. The conference established long term priorities for cooperation in key national economic sectors and in the area of research and development.

Priorities were also established for the comprehensive R&D program of the CEMA countries through the year 2000. This program is currently in the formulation stages, and all the countries consider it to be primary and definitive. The fields involved are: electronics, comprehensive automation, nuclear power, new materials and technologies, and biotechnology.

In this supplement to SVET HOSPODARSTVI we will gradually focus our attention on each of these priorities. The discussion of each field will characterize world developments and summarize current findings in the given field within the CEMA, as well as future plans.

Nuclear Power

Cooperation Among the CEMA Member Countries in Developing Nuclear Power

The executive agencies of the CEMA included the development of nuclear power among the top 5 long range priorities for R&D cooperation, which is supposed to speed up the application of R&D findings in all participating countries. Cooperation among socialist countries on the peaceful use of nuclear power already has a 30-year tradition. This cooperation has taken place not only in the construction of nuclear power plants but also in non-power applications of nuclear technology in industrial production, agriculture and health care.

Bilateral Cooperative Agreements

The first agreements concerning bilateral cooperation in the peaceful use of nuclear power were signed by the Soviet Union and other socialist countries as early as 1955. The basic purpose of these agreements was for the USSR to provide assistance in the building of a R&D base, the training of scientific personnel, the construction of research-related nuclear reactors, elementary particle accelerators, physical and radiochemistry laboratories in specific socialist countries.

These cooperative efforts bore fruit at the end of the 1950s and in the early 1960s with the startup of national nuclear power research centers in Bulgaria, the CSSR, Hungary, the GDR, Poland, Romania and Yugoslavia. These facilities included 9 functioning research reactors, six accelerators (cyclotrons), and seven radiochemical and physics laboratories. Later Cuba joined in the joint efforts to develop nuclear power. Hence, the USSR assisted in gradually installing physical and radiochemical laboratories, and a research facility in 1969.

Status of Nuclear Research

An important milestone in cooperation among socialist countries in the area of nuclear power was the founding of the Joint Nuclear Research Institute /SUJV/ in Dubna near Moscow in 1956. This institute merged two Soviet scientific laboratories for research in high-energy physics. The new institute also received two unique accelerators (synchro-cyclotrons) from the Soviet Government at no charge.

The charter members of the SUJV were Albania, Bulgaria, the PRC, the CSSR, the Korean People's Republic, Hungary, the Mongolian People's Republic, the GDR, Poland, Romania and the USSR. In the 1960s Albania and the PRC recalled their scientists, and North Vietnam and Cuba began to participate in institute activities. All member states have equal rights to the scientific activities of the institute and to its facilities.

At present more than 3000 people work at the SUJV, about 500 of whom are researchers. Scientists from countries outside of the CEMA also work here. Some of the countries represented are Finland, India, Belgium, Austria, and others. The institute also works closely with other centers for nuclear research, such as the European Center for Nuclear Research /CERN/ in Geneva, the International Center for Theoretical Physics in Trieste, etc.

The primary mission of the SUJV is joint theoretical and experiemental work in physics. These primary activities, however, are closely related to work which can lead to the discovery of still unknown energy resources.

Standing CEMA Commission for Peaceful Use of Nuclear Energy

During the development of nuclear energy R&D problems have continually arisen the solution to which has required complex and costly equipment, considerable sophistication in a number of branches of industry, and the formation of large

scientific and engineering collectives. Given these conditions, which demanded specialization and cooperation in developmental and production work, the Standing Commission for the Peaceful Uses of Nuclear Energy was formed in 1960 by decision of the 13th Session of the CEMA.

The activities of the commission, which coordinates cooperation between member countries in this entire area, are actively participated in by Bulgaria, the CSSR, Cuba, Hungary, the GDR, Poland, Romania, the USSR, Vietnam, and Yugoslavia. The commission has seven coordinating R&D committees.

The basic task of this agency is to facilitate multilateral cooperation among the CEMA member countries in reactor technology, nuclear power and its fuel cycle, as well as in nuclear instruments, radioisotope techniques and apparatus, radiational and shielding techniques, safety practices related to sources of ionizing radiation, and the standarization of products related to nuclear technology. All activities of the commission are thus directed towards the more efficient integration of nuclear technology into the economies of the member countries.

Interatominstrument

The production of instruments and nuclear equipment represents an important component of the cooperation among the CEMA countries in the peaceful use of nuclear technology. An international economic association, Interatominstrument, has been active in this area since 1972, with headquarters in Warsaw. The activities of this association are directed at coordinating work on the design and production of nuclear instruments and on the full satisfaction of the requirements of the member countries in terms of the product mix and quality of this equipment.

Interatominstrument has 51 employees, 29 of whom are specialists and 22 of whom are technical personnel. In addition to the Warsaw headquarters, branches have also been constructed at Zielona Gora in Poland, at Dubna in the USSR, and Plovdiv in Bulgaria.

Radioisotopes and Sources of Ionizing Radiation

An Agreement Concerning Multilateral Specialization and Cooperation in the Production of Radioisotopes was signed in Moscow in 1974. The first years after the agreement was signed saw the establishment of multiple production facilities in various countries for radioisotopes, labelled organic and inorganic compounds, radio-pharmaceutical preparations, sources of ionizing radiation, and a number of stable isotopes. Currently the list of products specialized in by the production facilities participating in this agreement is more than 1,250 items long.

The agreement established the responsibilities of participating organizations, the conditions of cooperation in foreign trade, pricing, etc. Organizations specializing in the production of a certain product are required to satisfy

the requirements of signatory countries with deliveries of agreed upon magnitude and according to the agreed upon schedule, and to provide products that meet the required technical specifications. Organizations not specializing in production must meet the requirements of their countries with imports of the requisite products.

Czechoslovak producers that are participating in this agreement are currently producing and delivering 200 specialized items. Deliveries of isotope production among the participating countries is showing ongoing growth while the volume of mutual deliveries between the CSSR and the USSR has reached the level of almost 1 million convertible rubles. Almost 90 percent of Czechoslovak exports of isotope production come under the terms of this agreement.

Nuclear Power and the Fuel Cycle

Just as the problem of assuring energy requirements is occupying an increasingly important place in international economic relations, so the development of nuclear power is the principal concern of CEMA member countries in the area of nuclear energy. In June 1984 the executive level economic conference of the CEMA member countries determined a strategy for the further improvement of economic cooperation among the fraternal countries, which is in turn related to an increase in public production. The conference emphasized that partner countries, in order to resolve the fuel and energy problem, must assure above all the efficient and rational use of energy resources, and likewise undertake appropriate measures in the production and mutual deliveries of fuel and energy.

An important agency for the cooperation of CEMA countries in this area is the Standing Commission of the CEMA for Electric Power, which as founded in 1956. (and which held the name prior to 1958 of Standing Commission for the Exchange of Electricity between the Member States and for the Comprehensive Use of the Water Resources of the Danube). Over the years it has been involved in the drafting of several documents related to multilateral cooperation in electric power, in the conduct of a number of research projects in the area of electricity generation, the operation of interconnected electric power systems, and environmental protection. Of the five sections on this commission, one is devoted to nuclear power.

The most important documents of the comprehensive program for the power generation sector for further improving and intensifying cooperation and for improving socialist economic integration among the CEMA member countries include:

--General Agreement on Cooperation in the Future Development of Integrated Power Systems of the CEMA Member Countries, Including the Necessary Cooperation with the Power System of Yugoslavia (dating from 1976). This agreement covers the future development of the power systems of the CEMA member countries through 1990 in practically all areas, including the integration of generation and consumption balances, the development of the sources and grid components of the integrated systems, increasing the efficiency of the production and distribution of electricity and heat, and research and development;

--Long Range Priority Programs of Cooperation /DCPS/ of the CEMA Member Countries in the Areas of Energy, Fuels and Raw Materials (dating from 1978). In conjunction with the General Agreement this program includes 13 selected tasks which are the object of the joint interest of the participating countries.

The top priority in the development of the power systems in the CEMA member countries at the present time is the construction of nuclear power plants and nuclear heating plants. The installed capacity of nuclear power plants in the member countries was 26,000 megawatts in 1983 and is to be increased to 75,000 megawatts by 1990. This will represent about 20 percent of all electricity generation capacity in the countries of the socialist community. Nuclear power plants are currently operational in Bulgaria, the CSSR, Hungary, the GDR and the Soviet Union, and plant construction is under way in Cuba, Poland and Romania.

The nuclear portion of the DCPS, which constitutes the framework for cooperation among the CEMA member countries for this decade, includes:

--the construction of nuclear plants in member countries with the technical assistance of the Soviet Union;

--international specialization and cooperation in the production and joint deliveries of equipment for nuclear power plants;

--the joint construction of nuclear power plants on the territory of the Soviet Union (with the investment costs being paid back with deliveries of power).

Bilateral cooperative agreements between the Soviet Union and individual CEMA countries (Bulgaria, the CSSR, Cuba, Hungary, the GDR, Poland and Romania) are tied into multilateral cooperative agreements.

Joint Construction of Nuclear Power Plants in the USSR

In addition to the cooperation among the CEMA countries in the construction of their own nuclear power generating installations, the joint construction of such facilities in the Soviet Union itself is also very important. In 1983 operations began at the first VVER-1000 unit of the South Ukrainian Nuclear Power plant. Romania is participating with the USSR in the construction of this plant which will have an installed capacity of 4,000 megawatts when completed. Romania will receive 5 billion kilowatt hours of electricity annually as compensation for its investment outlays.

Construction is likewise entering its final phase at the Chmelnicka nuclear power plant, which also has 4 reactors with a total capacity of 4,000 megawatts. The participating countries in addition to the USSR are the CSSR, Poland and Hungary. Czechoslovak deliveries of goods and equipment valued at 235 million convertible rubles, which will be completed by the end of 1985, will be paid back over a period of 30 years with deliveries of electricity. These began in 1984 and will peak at 3.6 billion kilowatt hours annually by 1988. To provide this quantity of electricity the CSSR would have to build 600 megawatts of generating capacity with its own resources. Deliveries from this plant to Hungary and Poland will be 2.4 billion and 6 billion kilowatt hours annually respectively.

Interatomenergo

The development of nuclear power poses important tasks for the engineering industries of the CEMA member countries. These tasks must be resolved on the basis of the international division of labor, production specialization and cooperation. In addition to several bilateral agreements between the Soviet Union and other member countries that were made at the beginning of the 1970s, an important step in this direction was the establishment of the international economic association, Interatomenergo, which was created by a resolution of the 28th Session of the CEMA in 1973.

The members of Interatomenergo, which is headquartered in Moscow, are the European CEMA member countries and Yugoslavia. Among the tasks being pursued by this association are:

--the development of schedules of needs and production runs for equipment, instruments and materials for nuclear power plants;

--formulation of proposals for specialization and cooperation as well as for expanding the production of equipment, instruments and materials for nuclear power plants by the industrial sectors of the signatory countries;

--proposals for the joint planning of production of specific types of equipment, instruments and materials;

--the transmission of design and engineering data to production facilities.

Multilateral Specialization and Cooperation in the Production and Deliveries of Equipment for Nuclear Power Plants

On the basis of the General Agreement concerning Cooperation in the Future Development of Integrated Power Generation Systems of the CEMA member countries through 1990 and the Program for the Maximum Feasible Development of Nuclear Engineering Capabilities of the CEMA Member Countries, which was adopted in 1977, the Agreement Concerning Multilateral International Specialization and Cooperation in the Production and Mutual Deliveries of Nuclear Power Plant Equipment from 1981-1990 was signed in June 1979.

Under the terms of this agreement, which was signed by the presidents of the governments of Bulgaria, the CSSR, Hungary, the GDR, Poland, Romania and the USSR and a representative of the Yugoslav Government, and which contains a program for nuclear power plant construction in each of the signatory countries, each country specializes in the production of particular pieces of equipment. Czechoslovakia specializes, for instance, on reactors and steam turbines, while Bulgaria is responsible for biological shielding equipment, Hungary for water purification systems, Poland for heat exchangers, the GDR for the production of overhead cranes, Romania for main circulating pumps, and Yugoslavia for specialized armatures and pumps. The production specialization program includes 140 items and is the largest program of its kind in the world.

Construction of Nuclear Power Plants in Individual CEMA Countries

Bulgaria

In 1966 the Governments of Bulgaria and the USSR signed an agreement for the construction of the first part of the Kozloduy nuclear power plant. In 1974 this unit, with its VVER 440 reactor, was started up, and followed in 1975-1983 by three more of the same type. The fifth and sixth units of this power plant will be outfitted with the VVER-1000 reactor, so that after their completion in 1987 the Kozloduy power plant will have an installed capacity of 3,760 megawatts. Bulgaria is the first country outside of the USSR where a VVER-1000 reactor will be built.

Construction has also been started on a second nuclear power plant at Belens, with four VVER-1000 reactors. The first unit of this plant is slated to begin operations in 1991-1992.

In 1984 nuclear power plants accounted for 18 percent of the installed power generation capacity of Bulgaria, with nuclear power accounting for 28 percent of the electricity actually generated. This placed Bulgaria sixth in the world and first among the CEMA countries. In 1990 nuclear power is to account for more than 40 percent of total electricity generated.

According to the agreement among the CEMA member countries concerning multilateral international cooperation and specialization in the production and mutual deliveries of nuclear power plant equipment Bulgaria produces specialized pumps and armatures, biological shielding equipment and equipment for technical transportation.

CSSR

The first agreement concerning Czechoslovak-Soviet cooperation in the peaceful use of nuclear energy was signed in 1955 and set the basis for the entire Czechoslovak nuclear program, and particularly for its power generation portion. With the assistance of the Soviet Union the A1 nuclear power plant was build and made operational in 1972 with a heavy water, carbon-dioxide-cooled reactor. Because of the technical difficulties involved in the construction and operation of this type of reactor, the Czechoslovak strategy for the development of nuclear power was reevaluated in the 1970s and the decision made to switch to the proven Soviet light water reactor of the VVER series.

In 1970 the USSR and CSSR Governments agreed to cooperate on the construction of four units at the V1 and V2 nuclear power plants at Jaslovske Bohunice, with VVER-440 reactors. Similar agreements were gradually concluded for four-unit, VVER-440 power plants at Dukovany and at Mochovce, as well as for the Temelin power plant, where four VVER-1000 units will be built.

Currently three of the units at Jaslovske Bohunice are operational along with one unit at Dukovany, and their 1,760 megawatts of capacity will provide 13.5 percent of this year's total electricity consumption in the CSSR. By 1990 all 12 VVER-440 reactors are slated to be operational, and the 5,280 megawatts of

capacity are projected to provide about 30 percent of total electricity consumption. In the year 2000 the installed capacity of Czechoslovak nuclear power plants is to reach 10,280 megawatts (in addition to the units mentioned above another VVER-1000 reactor is to be built at a location soon to be named) and these facilities are to provide more than 50 percent of our electricity consumption.

The construction program for nuclear power plants in the CSSR provides for the use of these power plants as sources of heat as well. The first heat line is now being built from Jaslovske Bohunice to Trnava. It is 23 kilometers long, is designed to provide 250 megawatts of heat output, and be put into operation this year. Plans are also in place for the construction of heat lines to Hlohovce and to Leopoldov. Investment projects have already been approved or are under review for the construction of heat transmission facilities from Jaslovske Bohunice to Bratislava, from Dukovany to Brno and from Mochovce to Levice, Nitra and Tlmac. Also under study is the economic feasibility and the necessary conditions for the construction of dedicated nuclear heat sources, i.e., nuclear heating plants.

The implementation of the Czechoslovak nuclear program is placing great demands on the Czechoslovak metallurgical, engineering, electrotechnical and construction base related to nuclear power. Thanks to long term Czechoslovak-Soviet cooperation the Czechoslovak industrial base is capable of assuring deliveries of equipment for primary and secondary circuits, for reactors, volume compensators, main circulating pumps, steam generators, separators and steam preheaters, turbogenerators, etc. both for nuclear power plants built in the CSSR and for those built in other CEMA countries.

The bilateral agreement between the CSSR and the USSR on cooperation in the production of equipment for nuclear power plants, signed in March 1974, was concluded for the production of 30 subassemblies for 5 VVER-440 units. An additional agreement signed in 1976 expanded the scope of these deliveries and increased the number of turnkey VVER-440 units. At the same time the groundwork was laid for production preparations for equipment for nuclear power plants with VVER-1000 reactors. These bilateral agreements have become one of the bases for the multilateral Agreement Among CEMA Member Countries and Yugoslavia for the Production and Mutual Delivery of Nuclear Power Plant Equipment Through 1990 which was signed by government presidents of the participating countries in June 1979. The overal contract backlog for deliveries of Czechoslovak equipment for nuclear power plants in CEMA countries under this agreement now amounts to almost 1 billion convertible rubles. The CSSR is producing about 25 percent of the reactor equipment for all nuclear power plants to be started up in the CEMA between 1983 and 1990, and by 1990 it will have produced and delivered equipment for 21 VVER-440 units.

Cuba

Under intergovernmental agreements concerning economic and technical cooperation signed in April 1981 the Soviet Union is providing Cuba with technical assistance in the construction of the Juragua nuclear power plant (Cienfuegos) with a capacity of 2 x 440 megawatts. The first unit is slated to begin operation in 1987, and the second unit a year later.

This power plant is being built according to a design different from that used in other countries where VVER-440 reactors have been built. The design changes reflect the conditions at the site; a tropical climate with high atmospheric humidity, a high level of seismic activity, electrical equipment that works on 60 Hz frequency cooling with ocean water, etc.

Hungary

Construction of the Paks nuclear power plant, which has four 440 megawatt units, began in 1974. The first unit was hooked up to the grid in 1983, and the second unit will be on line in the near future. The third and fourth units are to come on line in 1987 at which time this facility will cover about 25 percent of the country's electricity requirements.

Under a multilateral agreement between the CEMA member countries and Yugoslavia concerning the production and delivery of nuclear power plant equipment Hungary is specializing in machines for exchanging fuel, electrotechnical equipment, specialized equipment for repairing components and water purification equipment.

GDR

The experimental nuclear power plant at Rheinsberg with a capacity of 70 megawatts was the first VVER type reactor built outside of the territory of the USSR and has been in operation since 1966. Between 1973 and 1979 four VVER-440 units were gradually placed in operation at the Nord industrial nuclear power plant (Bruno Leuschner) near the city of Greifswald on the shore of the Baltic. Nuclear power accounted for 12 percent of total generated electricity last year.

The program for the development of nuclear power through the year 2000 includes plans for an additional 4 VVER-440 units, currently under construction at the Nord facility. When they are completed in 1990 the installed capacity of 3,520 megawatts at this site will make it one of the largest in the CEMA. The program also anticipates using VVER-440 reactors to supply heat. Since 1983 a 22 kilometer line has been in operation from the Nord power plant to Greifswald that is capable of transmitting heat equivalent to 300 megawatts of output. During the first phase (winter 1983/84) the output of this line was 40 megawatts, and a year later this was increased to 150 megawatts.

Another step in the building of a nuclear power system is the construction of the Stendal power plant which will have 2 VVER-1000 units. The first unit should be operational in 1990.

The GDR contributes to nuclear power plant equipment deliveries within the CEMA with overhead cranes and other equipment for technical transportation.

Poland

The government approved program for nuclear power development in Poland through the year 2000 provides for the construction of nuclear power plants with a capacity of 7,860 or 9,860 megawatts, allowing the nuclear power plants to provide roughly 30 percent of electricity consumption by the year 2000.

In April 1983 a USSR-Poland agreement was signed for cooperation in the construction of the first Polish nuclear power plant at Zarnowiec with four 465 megawatt units. The first unit, on which construction began last year is slated to come on line in 1990, and the entire power plant is to be operational by 1994. Poland is providing the turbine assemblies for this power plant.

Construction will begin on a second nuclear power plant at Kujawy or a Warta in 1987. This plant will have four VVER-1000 units and is scheduled for startup in 1994. A third power plant, also with four 1000 megawatt units would have to be started in 1989, and a site for it has to be chosen by early next year.

The government program for nuclear power development also includes the production of specialized machinery and power equipment for domestic use as well as for export under multilateral cooperative agreements with other CEMA countries. Under these agreements Poland produces volume compensators for power plants built within the CEMA, steam generators and other heat exchange systems. It also produces backup diesel engines and equipment to monitor radiation safety.

Romania

In Romania two power plants are currently under construction and preliminary construction work is under way for a third unit at the Cernavoda power plant. The reactors at this power plant are CANDU Canadian reactors with a unit capacity of 660 megawatts. They are heavy water reactors with pressurized piping. Romania has shown an interest in the purchase of 10 CANDU reactors.

Under a Romania-USSR agreement signed in September 1982 the Soviet Union will assist Romania in the construction of the Moldova power plant, which will have 3 VVER-1000 units. The first unit of this power plant is expected to be operational in 1990.

Under the multilateral agreement among the CEMA member countries for the production and delivery of nuclear power plant equipment for VVER reactors Romania specializes in main circulation pumps, overhead cranes for reactor and turbine buildings, and on some equipment for the emergency cooling system.

Soviet Union

The development of nuclear power in the Soviet Union is currently based on 2 types of reactors: the VVER, a pressurized water, light water moderated and cooled reactor, and the RBMK, a graphite moderated and boiling water cooled reactor. VVER reactors also form the basis for the development of nuclear power in other CEMA countries, and 2 units are operational as well in Finland (Loviisa).

The VVER series has its origins in 2 reactors at the Novovoronezh power plant (with capacities of 210 and 365 megawatts) and in the Rheinsberg reactor (70 megawatts). These reactors served as the basis for the development of 440 megawatt and 1000 megawatt units. There are now 28 VVER reactors in service.

RBMK reactors are being built only within the USSR at present. There are 17 units in service with a unit capacity of 1000 megawatts. At the end of 1983 the first 1500 megawatt unit was put into service at the Ignalina nuclear power plant.

The installed capacity of nuclear power plants in the USSR was 12,600 megawatts in 1980. An additional 24,000 to 25,000 megawatts is scheduled to be added by the end of the current 5-year plan, with nuclear power providing an estimated 220 billion kilowatt hours of electricity during this period. In 1984 nuclear power plants provided about 9 percent of total electricity generated, with an installed base of more than 27,000 megawatts. By 1990 installed nuclear power plant capacity should reach about 55,000 megawatts, with an additional 10,000 megawatts of capacity to be added annually in subsequent years.

Attention is also being paid to the use of nuclear power to generate heat. The first experiences in this area were obtained from the Belojarsk nuclear plant, with the Bilibin nuclear power plant also generating heat as well as electricity. Design work is in process for supplying heat to Kursk from the Kursk power plant and to Volgodonsk from the Rostov power plant. Odessa and Minsk will also be supplied with heat from existing nuclear power plants, Odessa from the Krymsk power plant.

A special light water reactor with a thermal output of 500 megawatts has been developed for use in nuclear heating plants, i.e., those designed exclusively to provide heat. The design of this reactor allows it to be built 2-3 kilometers from the nearest built-up section of the location to be supplied. Experimental facilities of this type are now under construction in Gorky and in Voronezh.

The USSR is also devoting considerable attention to the development of breeder reactors, the physical principle of which allows them to generate not only electricity and heat, but also new fuel for reactors that work with so-called thermal neutrons (both the VVER and RBMK series are such reactors). This represents an important solution to the problem of declining uranium deposits, which have so far been the sole source of nuclear fuel. Two experimental BOR-60 breeder reactors are operational: the BN-350 reactor at Sevcenko on the shore of the Caspian Sea which, in addition to generating electricity also desalinizes sea water, and an industrial BN-600 reactor with a capacity of 600 megawatts at the Belojarsk nuclear power plant. Scientists are working on designs for breeder reactors with capacities of 800 and 1600 megawatts.

Yugoslavia

Yugoslavia also participates in the joint work of the CEMA countries in the development of nuclear power. In Yugoslavia the Soviet Union assisted in the construction of a national nuclear research facility in the late 1950s and early 1960s under a bilateral agreement. Yugoslavia is a charter member of the Joint Nuclear research Institute and participates in the activities of the Standing CEMA Commission for the Peaceful Uses of Nuclear Power.

The Krsko nuclear power plant, with a capacity of 664 megawatts has been operational since 1983. It is equipped with a pressurized water reactor from the American company, Westinghouse.

Yugoslavia produces steam separators, collectors and piping for the Soviet RBMK-1000 reactors as well as specialized armatures and pumps under the multilateral agreement among the CEMA countries for mutual deliveries of nuclear power plant equipment.

9276
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KOZLODUY NUCLEAR STATION SHORT OF BUILDING MATERIALS, EQUIPMENT

Explanations for Supply Problems

Sofia BULGARSKI PROFSOYUZI in Bulgarian No 4, 1985 pp 6, 7

[Article by Angel Milev: "Without Debts to Site Number One"]

[Editorial comment] Under the direction of BULGARSKI PROFSOYUZI, and in honor of the 13th Congress of the Bulgarian Communist Party, a socialist competition is taking place between the collectives completing the construction and installation work and the supply of materials for the timely completion and start-up of the fifth power block at the Kozloduy nuclear power station [AEK].

[Text] May the fifth power block, site number one in our construction, enter the ranks on time! This is now the primary task of the builders and fitters at Kozloduy, the task of workers and specialists from many enterprises of the construction and machine building industries.

The task is a responsible one, with great economic and social effects. In spite of this there are people who underestimate it. Who are they? Which posts do they occupy? How and why hamper the work?

It is difficult to answer this stream of questions in a few words. But the facts themselves throw an abundance of light on them. When we go to the builders and fitters, or we visit the enterprises, which have negotiated contracts with the AEK, the picture becomes clear.

In January and February the brigade of twice hero of socialist labor Gospodin Yordanov did not fully complete the expected construction and mounting work, because the front for its work had not been created. Apparently the blame lay with the brigade of hero of socialist labor Ivan Lichev, but he also did not fully utilize the capacity of his brigade and the possibilities of his people, since the enterprises which make large steel cells, reinforced concrete constructions and other equipment and parts had not fulfilled their contracted obligations to the complex; they broke deadlines which they themselves had accepted and signed.

The managers of all these enterprises, the divisions of the Montazhi State Economic Trust, the Stomanobetonni konstruktsii i Izdeliya Economic Combine, the Khidrostroy State Economic Trust, the Stroitelni Materiali Corporation, and of the machine construction industry reply: "the Metalsnab State Economic Trust did not ensure the supply of the necessary materials. But it is not to blame!"

Thousands of tons of iron for the concrete, high tensile steel, rolled steel, various types of sheet metal, etc., are not lost in the files of the supply organization. Where are they then? Why are they not at the site in Kozloduy or at the enterprises which are working on it? Who is responsible for this? The Metalsnab State Economic Trust and its general director Strakhil Petrov, or the general directors of the metallurgic combines in Kremikovtsi and Pernik and the cast iron foundry in Ikhtiman? Or the general directors of the construction combines and organizations, Velko Bulgaranov, Ivan Krustev, Kamen Kamenov, or...?

The vice general director of the Metalsnab State Economic Trust, Aleksandur Kashukeev, says: "We plan for what the construction organizations need, and they have a limit for this." But the builders explain: "We need everything that is necessary for developing an excellent reinforced concrete construction. If one meter of iron or 100 kilograms of cement is lacking, we cannot replace this with dry twigs or white soil."

Sheet steel is in short supply at the fifth power block, as are high quality steel and other metallurgic products. Practice reveals this. It neither covers up the truth nor forgives anyone; it always lays the blame for final results at someone's doorstep, those who stand by the lathes and machines. For example, during the first three months of this year, 1,230 tons of iron for concrete, with a diameter of eight millimeters, was needed by the Stomanobetonni Konstruktsii Economic Combine to carry out the construction program at the Kozloduy AEK and at other priority construction sites. By the middle of February the enterprise had received nothing. At the same time the Montazhi State Economic Trust was expecting 100 tons of six-millimeter sheet metal, and the Promishleno stroitelstvo State Economic Trust, more than 3,000 tons of steel for concrete.

"They will have to wait at Kozloduy," the employees of the supplying organizations say with compassion, somewhat tired of quarrels with procedures and consumers. They talk like that because they know that we cannot help them with anything. And the producers have closed the doors of their warehouses and unceremoniously announce that they can give nothing more. Perhaps we are to blame, they say, but that is the situation. But what is this situation, how did it arise, who created it? Any literate person can see: the plans for the production sections of the metallurgic combines are developed according to the full utilization of production capacities. This is most important. Second, often as a result of imprecise forecasting in one planning branch or another, unanticipated demands arise, and complying with them creates holes in supplies. Third, unexpected accidents cannot be excluded, these sometimes take out whole lines for a week or two.

But these are the minor troubles. The great, aggravating pain in supply belongs to the planning organizations which are legally responsible for the lack of correspondence in the plans affirmed for construction and limiting the materials for it; these are often unattainable, and in some cases they cannot be imported. Undoubtedly this pain, which comes from the top, reaches down to the lowest rungs and hinders the movement of the construction organism. For example, in the first three months the Promishleno Stroitelstvo State Economic Trust had a production plan, the fulfillment of which required 18,900 tons of rolled steel, but the limit determined for that goal was 12,500 tons, without taking into account the corrections made in the anticipated construction and installation work. It was necessary to save 6,400 tons of metal in three months, but how? Were there not some hidden reserves somewhere, covered with a tarpaulin is some warehouse, or was not it possible to substitute something else for the rolled steel? In this case, what would happen with the quality and reliability of industrial construction? And what would they do at such construction sites as Kozloduy, where the designer and investor can tolerate no deviation from the working designs and blueprints? Naturally, since they had no other choice, the construction organization "consumed" it from the second quarter and will end the year in the red, and striking out this debit will take a lot of time from people, wreck their accounts, and keep them on tenterhooks for long periods.

We will not comment on the objective character of certain facts, which have created such a situation. The question is not for managers of construction and other economic organizations to be forced to demonstrate unrealistic needs, or for them to make savings which can have the opposite results.

It is necessary to act more sensibly in regard to the requirements of objective economic laws for planned, proportional development. In order to do this, all material balances should speak the same language, in order to link the scope and quality of construction and fitting work with the quantity and quality of construction materials. There is room for improvement in the work of metal producers and organizations in the assignment and transport of materials to consumers. The slightest failure to anticipate reflects negatively in the metallurgic combines, even if there is time to correct it, because this influences, in a particularly strong way, the instability of supply of raw materials and the shipping of finished products. In the first half of February, at the L. I. Brezhnev Metallurgic Combine, they had around 3,000 tons of iron for concrete, and the enterprises which were making construction pieces for Kozloduy were looking for it under rocks and trees. But it could not be shipped to them, for the simple reason that cars with loose freight were freezing, and the installations which heat them up and clean them were not able to complete this work in time.

Unfortunately the dispatch of small parcels, which takes place by special vehicle transport, was slowed. In fulfilling the 39th Council of Ministers Letter, the organs of control place sanctions on those organizations and drivers who use the trucks for transport outside their rayons. And when

the Promishleno Stroitelstvo State Economic Trust was furnished with a special permission, local branches of Metalsnab in Pernik and Ikhtiman tried to guarantee that they would be free of eventual fines as freight shippers. But there is no such guarantee, and because of this 20-ton freight vehicles with trailers were forced several times to return without loads from Ikhtiman to Stara Zagora, while in Kozloduy they were waiting for the pieces.

There are worse cases. Last year three plants of the Montazhi State Economic Trust produced more than a kilometer of piping, on request of Gazstroy-Montazh in Gorna Oryakhovitsa; the tallest basketball player in the country could pass along inside the pipe, standing straight up. The collective carried out its work well, but it fell into debt, as they say, for one million leva. The AEK did not ensure a front for installing this, for all the reasons cited above. Still it had to pay for it. But according to the Regulations for the Economic Mechanism, the investor cannot pay for something he has not used. In short, the Kozloduy AEK insisted on maintaining the agreement while the production was completed, and when the partners informed them that they were ready, they started to beat a different drum, and they wondered how they would arrange the payment.

A great danger exists in starting up the fifth power block late. This is why now the major means for speeding up construction at the fifth power block of the Kozloduy AEK is to apply the economic approach everywhere, in order to move the economic levers with full advantage for site number one, to expand socialist competition with renewed vigor.

Blame Placed for Non-Fulfillment

Sofia RABOTNICHESKO DELO in Bulgarian 14 Jun 85 pp 1,3

[Article by Iliya Borisov: "Who is not Fulfilling His Obligation and Why"]

[Text] Of the anticipated 20 million leva cost of equipping the site at Kozloduy, barely 4 million leva has been spent so far on machines and equipment that have been supplied. The combine for heavy machinery in Radomir is seriously late in filling its orders, and this threatens the flow of construction and installation work. The low quality of large steel cells (SYaM) produced at the plants of the Economic Combine for Heavy Machine Building in Ruse continues to cause alarm.

The contours of the first 1,000 megawatt reactor are now taking shape. Everything is directed to one common goal: beginning the start-up operations within a year in order to include the 1,000 megawatt block in the nation's power supply system.

Among the many problems and unresolved tasks, the question of timely supply of local equipment stands out. A number of enterprises devote themselves sensitively to their responsibility and assist in the timely fulfillment of contracted agreements. The investors directorate at Kozloduy has expressed its satisfaction with the significantly improved work in securing

equipment from a number of suppliers. In one of the previous publications from this correspondent's post, critical words were directed at the Elprom-Energo Combine in Sofia, and the Vaptsarov plant in Pleven. A check has now shown that measures have been taken to overcome the delays permitted by these two suppliers. The Elprom-Energo Combine in Sofia has made up for the delay and at the end of May delivered the equipment for the first transformer. The Vaptsarov plant in Pleven also took serious measures for producing and dispatching some of the pumps. The head of the Mestni Dostavki section, engineer Metodi Terziyski, shared his satisfaction with the rapid and effective work at the Struma plant in Pernik, where a competition has been organized for timely fulfillment of orders for the fifth power block. The brigade leader has visited the site and become acquainted with the tasks which his brigade has to carry out. Recently a special team from the Sofia okrug placement-supply organization, headed by director Kiril Kurtev, visited the construction and, without any obligation, has agreed to help, by carrying out work worth more than 300,000 leva. The collective of the Narkoop in Vratsa voluntarily offered its services to furnish the new kitchen and dining hall, as well as supplying equipment worth 100,000 leva. There are other such examples, which show that enterprises that have agreed to participate in the socialist competition in honor of the Thirteenth Part Congress, directed by BULGARSKI PROFSOYUZI, have mobilized the efforts of the supply collectives for attaining this great goal.

Unfortunately, there are still many questionable actions. We should not forget that about one hundred enterprises are participating in equipping the new type 1,000 megawatt reactor. And each of them has its greater or lesser obligation. The delays are great. In the first five months of this year only four million of the anticipated 20 million leva worth of equipment has been supplied.

Once again, for the Nth time. engineer Boris Georgiev, director of the Directorate for Investor Control at the Kozloduy AEK, and other specialists and builders from Promishleno Stroitelstvo management spoke about the unsatisfactory and low quality of production of large steel cells made by the Ruse Combine for Heavy Machine Building. People in the brigade of hero of Socialist Labor Ivan Lichev are forced, through additional work and many other efforts, to correct the quality problems and bring the construction parts into compliance. Time is lost, technologies are violated, suitability and quality of construction and installation work is at risk. And what we need least of all here is to overlook these basic things! It is high time we understood that everything produced for this unique power block must be of high quality, so that it will be reliable in the future, when it is put into use.

Most alarming is the situation with supplies from the Economic Combine for Heavy Machine Building in Radomir. It must furnish three emergency hermetic locks, each of which weighs 46 tons, and the basic lock weighs 92 tons. This is 230 tons of equipment, production of which has not been started, and even less is known about when the production will be completed. Installation of the locks is designed to take place simultaneously with construction

of the reactor section. This is the cause for all the talk here of having to stop construction temporarily at a certain level. In the agreement signed by the combine in 1983, it was anticipated that fulfillment would take place at the end of that same year. Deadlines have been pushed back several times, and it now seems that they will not be kept. Again in Radomir they were supposed to produce three hydraulic locks, but as of now none has been made.

The excuses are most varied: "We have no materials, we are working on export items," "The equipment is new, that causes difficulties." Perhaps these are true, but we are talking about an order that was placed four years ago . . . Is not this sufficient time to find the correct way?

There are other gaps as well in the supplies from the plants. Not everything is in order at the investor directorate, which is sometimes slow in its agreements and the timely assurance of designs for various orders.

Taking into account the significance of this sight for resolving our power supply problem, the supplying enterprises must manifest the necessary comprehension and, with priority, on time and with high quality, develop and supply everything needed at the fifth power block. This will bring about a real contribution to setting it in operation next year and ensuring the necessary power supply for the national economy.

12334
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BULGARIA

KOZLODUY NUCLEAR UNITS' OPERATION EXCEED ALL CEMA RECORDS

Sofia RABOTNICHESKO DELO in Bulgarian 23 Jun 85 p 2

[Article by Iliya Borisov: "The Creation of the Atom"]

[Text] Today, power supply engineers in our nation are celebrating the holiday of the profession. During this year there have been many reasons for speaking about those who provide heat and light for our homes, for the electric energy which powers machines in hundreds of factories and plants. In today's issue, we will speak about people who have made the greatest contribution to the fulfillment of responsible assignments which the power supply engineers are solving; these people are the workers at the Kozloduy Nuclear Power Plant [SAEK].

Here the peaceful atom rages day and night. And that is how it has been for eleven years. Powerful currents of electric energy have been flowing during this time from high tension lines to the nation from Kozloduy, on the shore of the Danube. Expressed in figures, this means 30 percent of the total production in the nation. And the SAEK itself is secure and stable source of light, heat, and energy.

I asked where the action is the hottest these days. They told me that work is intensive everywhere, because there are no front lines or rear guards here. Everything has to be in order and in good shape; the processes of burning nuclear fuel in an atomic reactor are complex.

As with the other personnel, the people working at the reactor shop have carried out their duties conscientiously during the difficult winter months. Full loading was achieved during the five months of winter. The first atomic plant produced 6 billion kilowatt hours of electric power. This is a record, the best result ever in the CEMA countries which use this type of water-water reactor.

But no one is resting on his past laurels. There is no time for rest. I saw, on an illuminated board, the awe-inspiring accounts of daily, monthly, and annual production of electric power. The six-month plan has been fulfilled ahead of schedule, by 13 June. By the end of the month, the Kozloduy power supply engineers will secure half a billion more kilowatt hours than planned, a truly great success.

"The most important of these fine results in production is the timely and high-quality conduct of the repair campaign," the director of repairs, engineer

Dimitur Petrov said. "We have already finished reloading the third block. Now, on the eve of Energy Day, we have finished work on the fourth block ahead of schedule. We are getting ready for the repairs on the remaining two, so that by October we can meet the fall season fully ready."

"True commanders of the peaceful atomic front have matured during the past few years at our power plant. These are people who skillfully manage the complex production technology," reported the vice chief director, engineer Stoyno Georgiev. "Soviet specialists have helped us a lot; we work closely and cooperatively with them."

One of my most interesting sources is the plant's chief director, engineer Georgi Dichev. I remember him from the time when he first came here. A good bit of time has passed since then. Now he is burdened by years, but he works with the same passionate energy, seeking to get involved in and see everything, to help and encourage. The fruit of his restless character and creativity is strengthening scientific activity and the successful resolution of important problems in the field of scientific-technical progress.

And he is satisfied with the collective's achievements on the eve of Energy Day: "We have provided 106 million kilowatt hours of power, simply by the early completion of repairs and the reloading of the third block; that is equal to 40 thousand tons of imported coal."

Today and tomorrow, day and night, the heart of the first nuclear plant beats steadily. The peaceful atom will rage. The Kozloduy power supply engineers are aspiring to a new goal: producing 30 billion kilowatt hours of electric power this year. This is their promise in honor of the upcoming Thirteenth Party Congress. And they will be good to their word.

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BULGARIA

NEW SCIENTIFIC-TECHNICAL METHODS DEVELOPED AT NUCLEAR POWER UNIT

Sofia RUDNICHAR in Bulgarian 13 Jun 85 pp 1,2

[Article by Nevena Markova: "Efficient Collectives"]

[Text] Great opportunities exist at the Kozloduy Nuclear Power Unit [SAEK] for implementing the achievements of scientific-technical progress and the four power blocks of the VVER-440 type which are in operation. Several program-creative collectives were created for this purpose, and they contribute to increasing the efficiency of power production.

In terms of the tasks which are being carried out in this regard, the chief director of the nuclear power plant, engineer Georgi Dichev reported:

"Efficient, creative collectives have been created to resolve our scientific-technical problems. Worthy of praise in this area is the Base for Development and Implementation, headed by engineer Radoslav Georgiev. And with its machines and technology for production, the nuclear power plant represents a solid base for technical progress here.

"Over the course of several years, we developed a sufficient number of topics linked to optimizing nuclear fuel. The results attained have a significant economic effect. Our conclusions and proposals were fully affirmed at a consultation with Soviet specialists."

During the repair campaigns this year, the four power blocks will be loaded with fresh fuel, according to a new reloading method. The economic effect, based on a unit of fuel equal in value to the savings of nuclear fuel, will reach more than 26 million leva for three reactors. This development is the work of a creative group with the following staff: engineer Nikola Alekov, and physicists Rangel Simov, Taveta Khalampieva, and Radka Milanova, led by engineer Georgi Dichev. The collective has been recognized for its inventiveness and it has been awarded a design citation.

A scientific production group led by engineer Georgi G'oshev is working successfully on problems of radio-nuclidic control at the Kozloduy SAEK.

"We already have two recognized inventions," engineer G'oshev says, "for the first time in our nation, we have implemented a new method for controlling

iodine-129. Last year we introduced a system for machine processing of data by radiation control, which significantly eases our work. By the end of 1985, we will implement a new method for cleaning liquid concentrates from the cesium radio-nuclides at the plant."

One of the tasks, which is being resolved by the program-creative collective led by Radoslav Georgiev, is linked to the problem of computerizing the operative management of the four power blocks. The program has been worked out in detail, and the necessary means have been refined; the first results are already available.

The work on robotization and mechanization of labor has also produced good results. Many mechanisms and devices have been developed and realized. The need for robotic devices for defect detection control and hermetic sealing of the steam generator pipes, however, is great. Thus the attention of many specialists has been turned in this direction.

The efforts of the Kozloduy innovators have been directed toward problems such as: increasing the technical and economic efficiency of the technological processes; implementation of avant-garde repair technologies; utilization of low-potential energy for technological media; forecasting the behavior of equipment, metallography, defect detection, etc.

There is no doubt that, working with their characteristic diligence, they will bring all this to a successful conclusion.

12334
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REVIEW OF 30-YEAR DEVELOPMENT OF NUCLEAR RESEARCH, TECHNOLOGY

East Berlin KERNENERGIE in German No 5, May 85 pp 209, 210

[K. Rambusch: "Development of Nuclear Research and Technology in the GDR"--Dedicated to the 40th Anniversary of the Liberation from Fascism]

[Text] Ten years after the victory over fascism, the development of nuclear research and technology was begun, and thus the peaceful use of nuclear energy in the GDR.

On 28 April 1955, an "agreement on assistance by the USSR to the GDR for developing research in the field of nuclear physics and the use of nuclear energy for the economy" was concluded at government level.

In the preamble of the agreement, the great importance of using nuclear energy for peaceful purposes is particularly stressed. It was agreed that the Soviet authorities would deliver the equipment for construction of a water-water-reactor with a thermal capacity of 2,000 kW and a cyclotron for energy of 25 million electron volts for Alpha-particles, and grant further support through corresponding scientific-technical assistance and support in planning, building, assembling, adjustment and start-up, and in addition through transfer of scientific information and technical data. Complementary training of scientists, engineers and students at Soviet institutions is provided for. Furthermore, delivery of fissionable and other materials is arranged. Information and data for the reactor and the cyclotron is given gratis. Payment for equipment, materials and planning work is carried out within the framework of the existing trade agreement.

The agreement of 28 April 1955 was of very special significance for the GDR. The provisions of Control Council Law Nr. 26 of May 1946 were written especially with a view to limiting or forbidding, respectively, research and development in the fields of nuclear physics and nuclear energy. Lectures at universities and technical institutes on the "structure of matter" imparted approximately the state of knowledge as it existed in the mid-thirties and late thirties. The intellectual and material support and assistance offered by the USSR could not be overestimated. The GDR had to expend great efforts and funds in order to utilize the proffered help and support for direct promotion of scientific-technical research. It is characteristic of SED policy and the work of the GDR government that the numerous

prerequisites for utilizing the proffered possibilities were created on such a large scale and during a relatively short timespan.

After intensive preliminary work and clarification of a great number of personnel questions, on 11 November 1955, the GDR Council of Ministers passed resolutions on the formation of a scientific council for the peaceful application of nuclear energy and on the founding of an office for nuclear research and nuclear technology.

The "Scientific Council for the Peaceful Application of Nuclear Energy" was composed of representatives of the party, the government, and scientists. Prof Dr Gustav Hertz was appointed chairman. The chairman of the Council of Ministers appointed the chairman and members of the scientific council. The scientific council was to advise the Council of Ministers on all questions of peaceful use of nuclear energy. The necessary basis was created through the formation of special commissions, and extraordinarily great and valuable work was carried out which was of great importance when newly founded institutes and plants took up their work.

The Office for Nuclear Technology and Nuclear Research, a state central leadership organ operating under the direct control of the Council of Ministers, was responsible for promotion, coordination and control of all work in the fields mentioned; it had to work out and instigate long-term planning and carry out the necessary coordination with the ministries and central institutions.

On 1 January 1956, the Central Institute for Nuclear Physics was founded. After considerable construction, assembly and installation work, on 16 December 1957 the 2-MW (th) research reactor supplied by the USSR was started up in this institute, and the cyclotron became operational on 1 August 1958. A special achievement during the initial phase of the institute was the drafting and construction of the Rossendorf ring zone research reactor which became available for research tasks by the end of 1962.

Additional institutes for nuclear research and nuclear technology were founded in the early years, which started research work very soon, such as the institutes for

1. applied physics of purest materials by the Ministry for Ore Mining and Metallurgy,

2. physical mass transfer (now the Central Institute for Isotope and Radiation Research),

3. applied radioactivity by the Ministry for Chemical Industry,

4. research into dust and radioactive floating particles by the Office for Nuclear Research and Nuclear Technology.

In November 1955, the department for nuclear technology, founded within the framework of the Technical University of Dresden, began training students

in the specialized fields of nuclear physics, radiochemistry, nuclear energy and actinometry. The installations necessary for this training had also been constructed in a very short time.

Also of great importance was the founding of the state-owned Vakutronik plant, Dresden, in 1956. This enterprise developed and produced measuring instruments and special installations for nuclear physics, and essentially managed to supply the rapidly growing demand in ensuing years. Today, this enterprise is part of the state-owned combine Messelektronik. It must also be mentioned that the state enterprises Carl Zeiss Jena, Transformatoren und Roentgenwerk Dresden, Laborbau Dresden, Rathenower Optische Werke and others were already actively at work by 1956/57 within the framework of nuclear research and nuclear technology.

The use of radioactive and stable isotopes in applied research, medicine, and in many forms in industry, was achieved to an astonishing degree. It was made possible through the cooperation of the institutes and enterprises mentioned above.

The agreement of 29 April 1955 was the basis for further agreements and arrangements which in the ensuing years were concluded between the governments of the GDR and the USSR, central state authorities, scientific institutes and enterprise, respectively. The agreement on granting technical assistance in the construction of the first GDR nuclear power plant must be cited as one of the most important ones. This agreement made it possible for extensive work to be organized and begun in the research institutions and industry for use of nuclear energy in the production of electric energy. A Scientific-Technical Office for Reactor Construction was founded in 1958 in order to use the proffered assistance and to initiate and carry out the necessary development and research work. Taking on construction and planning work for the first GDR nuclear power plant necessitated expansion leading to the formation of an enterprise which, as of 1962, became responsible for the preparation, projection, construction, start-up and operation of the Rheinsberg nuclear power plant.

In 1962, the Office for Nuclear Research and Nuclear Technology was dissolved. By merging the research establishments of the office with the Academy of Sciences of the GDR, by integrating the enterprises in the respective economic units, and by forming the "State Center for Radiation Protection," which later became the State Office for Nuclear Safety and Radiation Protection of the GDR, it was possible to preserve the valuable results and work experience in nuclear research and technology and to work on the ensuing tasks within the respective institutions. Consequently, the department for nuclear technology of the Technical University of Dresden was also dissolved and the special installations and institutions were merged with the regular departments.

The tasks and work of the "Scientific Council for Peaceful Use of Nuclear Energy" were transferred to the Research Council of the GDR.

When the Rheinsberg nuclear power plant became operational in May of 1966, the first phase of development and organization, recognition of the tasks and expenditures for the future use of nuclear energy for production of electric energy, was concluded.

The next phase was determined by the "agreement of 14 July 1965 between the government of the GDR and the government of the USSR on the expansion of cooperation in the construction of nuclear power plants in the GDR."

That agreement, and appropriate amendments, deals with the construction of the Nord nuclear power plant and regulates the services, deliveries and obligations of the partners to the agreement. In accordance with the declared intentions of the agreement, after a 4-year construction period the first stage of the power plant with 440 MW (e) was put into test operation in December 1973, followed by the second unit in 1974. At present, the nuclear power plants constructed and operating in the GDR provide more than 11 percent of the electric energy produced. Their share of the republic's installed capacity amounts to a little more than 8 percent. In the coming years, the fifth through eighth units of the Nord nuclear power plant will begin operation with 440 MW (e) each, so that the final capacity of the power plant will reach 3,520 MW (e). The Stendal nuclear power plant with 4 reactors of 1,000 MW (e) each will begin operation according to the government's stipulations. Training of expert personnel for development, planning, construction, start-up, operation and maintenance is being carried out at the Technical University of Dresden and the Engineering Institute in Zittau. In 1978 and 1979 respectively, these institutes of higher learning managed to make teaching and research reactors operational based on their own designs.

The state and economic institutions necessary for peaceful use of nuclear energy are integrated in the socialist state structure of the GDR.

The Council of Ministers of the GDR determines development goals and construction stages of the nuclear power plants. The resolutions of the Council of Ministers passed at the end of 1983 contain the tasks for the coming years and clarify the prospective development of peaceful use of nuclear energy.

The state planning commission and the GDR ministries are responsible for the balance sheet and execution of the resolutions. Implementation is carried out by the combines and foreign trade enterprises under the ministries, and by the Academy of Sciences. The combine Kraftwerksanlagenbau, Berlin, for example, must assume the general contractorship for the construction of nuclear power plants. This task comprises the preparation, planning, and coordination of work for construction of the installation, including their own performance in providing equipment and assembly work, start-up and test operation. The general contractor is responsible for maintaining safety regulations and must provide proof of the nuclear safety of the nuclear power plant.

The tested installation is given (sold) to the state combine Kernkraftwerke "Bruno Leuschner," Greifswald. This combine, as principal investor is responsible for providing the investment funds, details of the order, the construction site, integration of a nuclear power plant in the planned territory, and obtaining from the Office for Nuclear Safety and Radiation Protection the coordination and permits necessary for construction. The Kernkraftwerke combine is also responsible for the plant, compliance with the very strict regulations on operation and control, procurement of nuclear fuel, maintenance and necessary repairs.

It behooves us to remember that the victory over fascism in 1945 was the basic event for the peaceful use of nuclear energy and the 30-year development of nuclear research and nuclear technology in the GDR, and that during the entire period active assistance and support was granted by the USSR.

9917
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BRIEFS

NUCLEAR TESTS DENOUNCED--Quito, 29 Jun (DPA)--The South Pacific Permanent Commission, with the mandate of Colombia, Chile, Ecuador and Peru, today denounced the increase in French nuclear tests on the Mururoa Atoll saying that there have been four in less than 6 months. According to the commission, the explosions took place on 1 and 9 May and 4 and 8 June of this year, as compared with only three tests in 1984. The four explosions this year bring to 70 the number of nuclear tests carried out by France since 1960, when it began testing atomic devices on the Mururoa Atoll in the South Pacific between Tahiti and Easter Island. The commission, an intergovernmental organization based in Quito, also stated that "France has ignored the protests of the Pacific Basin countries." It added that the nuclear explosions seriously damage marine resources in the South Pacific. The explosions are detected by seismographers in New Zealand and Australia and reported to the Pacific Basin countries. [Text] [Hamburg DPA in Spanish 1538 GMT 29 Jun 85]

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ARGENTINA

COSTANTINI: NUCLEAR POLICY IS NOT IN CRISIS

Buenos Aires CLARIN in Spanish 2 Jun 85 p 16

[Text] The head of the National Commission for Atomic Energy (CNEA), Alberto Costantini, said yesterday in Bariloche that "the Argentine nuclear policy is not in crisis," although he admitted that the advances in connection with the nuclear electric power plants will be limited for the time being "to the realm of concrete realities."

In outlining that body's current policy, he explained that scientific research, the training of professional workers and the uses of nuclear energy for peaceful purposes, such as their application in medicine and industrial development, "should be regarded from now on as priority aspects of our administration."

He commented on the current situation in the development of atomic energy in Argentina and its future prospects on the day after the main sessions commemorating the 35th anniversary of the founding of the CNEA were held in this city, coinciding with National Atomic Energy Day and the 30th anniversary of the founding of the Balseiro Institute. President Raul Alfonsin attended the ceremonies.

Costantini admitted that the delay in the approval of the budget for this year is having a negative effect on the continuation of the projects undertaken by the CNEA, because of their high financial cost.

"We hope," he went on to add, "that nuclear energy will not become a factor in state power, but that it will instead be placed in the service of mankind." He noted by way of example the application of radioisotopes in medicine, biology and genetics.

No Consensus

He went on to explain that the presence of his Latin American colleagues at the ceremonies held at the Bariloche Atomic Center "should be regarded as a regional reaffirmation of the peaceful uses of atomic energy," despite the fact that the delegates were not able to reach agreement on a document to be signed to this effect.

On the other hand, some representatives regarded Costantini's meeting with the heads of other Latin American nuclear commissions as really being a kind of preparatory session for the scheduled November meeting of the Inter-American Nuclear Energy Committee, a body under the jurisdiction of the OAS. In answer to a question, Costantini said that both with regard to the nuclear power plants, "which are today providing about 11 percent of our domestic electrical production," and the fuel cycle, the advances will be limited "for the time being to the realm of concrete reality."

5157
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BRIBERY CHARGE RELATED TO NUCLEAR REACTOR SAID CONFIRMED

Buenos Aires CLARIN in Spanish 13 Jun 85 p 25

[Text] The head of the National Administrative Investigations Supervisory Board, Ricardo Molinas, has obtained evidence from Swiss banks, with the assistance of the court system in that country, proving the payment of $4 million to the late Jose Gelbard, who served as minister of economy under Hector Campora and Juan Peron, by foreign enterprises interested in the installation of a nuclear reactor at the Rio Tercero reservoir in the province of Cordoba, which occurred in 1973.

Molinas issued a statement entitled "A Serious Transaction Clarified" yesterday, in which he stated that Italimpianti, an Italian enterprise, and Atomic Energy of Canada Limited, a Canadian enterprise, paid that sum into the Opera account established by Gelbard at the Trade Development Bank in Geneva. These funds were later transferred to other personal accounts maintained by this official.

The evidence mentioned by Molinas was obtained thanks to the timely investigation launched by the body he heads during the administration of Sadi Conrado Massue, and headed by Deputy Prosecutor Antonio Luis Beruti, into the irregular payment to third persons of a substantial "commission," which at the time led to a parliamentary investigation in Canada.

According to the document released by Prosecutor Molinas, the matter ended in the obtaining of specific information from the Swiss bank concerning the ownership of the account in which these funds were deposited.

Molinas said that the records of judicial proceedings by the Swiss state were obtained through the Foreign Ministry in connection with Case No 3693, currently being handled by Federal Judge Miguel Pons, to whom it was turned over by the National Administrative Investigations Supervisory Board.

The Swiss Republic and the Canton of Geneva definitely confirmed the ownership of the Opera account at the Trade Development Bank in Geneva, to which the greater part of the funds paid out by the supply enterprises Italimpianti and Atomic Energy of Canada Limited was deposited.

The prosecutor added that "the long and persistent efforts pursued by the federal court and this supervisory board, in which connection they had the needed support of our Ministry of Foreign Relations, fully confirmed the suspicion of graft, in which connection the board will initiate court proceedings.

As a result of the reports received in July of 1983, the statement released goes on to say, charges were filed in a court of the first instance in the city of Geneva, which handed down a judgment in favor of the petition by the Argentine court authorities.

After various appeals filed by the heirs to the account holder, now deceased, had been heard, the court in Lausanne, Switzerland, made a final ruling on the case, ordering that the information requested be provided.

According to the records on the case, Molinas went on to say, Jose Gelbard established a regular account identified as "Opera" at the Trade Development Bank on 24 November 1972, and maintained that account until 23 September 1976.

On 2 May 1974, the sum of US$2.5 million was transferred to that account from the Swiss-Italian Bank in Lugano, and and a little later, on 27 May, another US$1.2 million was transferred to the account from the Italian Commercial Bank in Genoa, on the orders of Italimpianti, in connection with the expenditures pertaining to the nuclear power plant in Cordoba.

On 26 March 1976, finally, the Opera account was credited with US$300,000, also transferred from the Swiss-Italian Bank. Molinas added that "in accordance with the instructions of said Jose Ber Gelbard," the funds in question "were transferred from the Opera account to Account No 24777/AB, which Gelbard had established at the Trade Development Bank 2 years earlier.

This latter account was closed on 30 September 1974, the balance being transferred to a new account known as "Gidul," in the name of Jose Gelbard and members of his family. That account, in turn, was closed on 9 April 1976, the prosecutor said.

5157
CSO: 5100/2134

ARGENTINA

'SMALL' NUCLEAR POWER CENTER PLANNED IN CORDOBA

PY210002 Buenos Aires TELAM in Spanish 0054 GMT 28 Jul 85

[Text] Cordoba, 17 Jul (TELAM) -- National Atomic Energy Commission (CNEA) President Alberto Costantini announced here tonight that the CNEA has decided to build a small nuclear power center in Embalse, 110 km south of this city. The center will comprise two plants, which will produce cobalt-60 and radioisotopes, and a 15-mw reactor, and will cost approximately $40 million. This important project will be supplemented by the laboratories and the infrastructure necessary for this type of plant, which will be similar to CNEA centers in Ezeiza, Contituyentes, and Bariloche, he said.

Costantini released this information at a press conference during a meeting at Government House. The meeting was attended by Provincial Governor Eduardo Cesar Angeloz, provincial government officials, and CNEA technicians.

Costantini said the CNEA decided to build the center in Cordoba not only because of the governor's considerable efforts to have it built in his own province, but also because of the importance the local industry has given to quality control processes, particularly in the aircraft and automobile industries.

He added that the CNEA has also taken into account the high quality of the local university, and said the CNEA will grant scholarships to professionals wishing to specialize in nuclear science at CNEA's Balseiro Institute, in Bariloche.

The technicians who developed the so-called Cobalt-60 Project reported the technical details. They said the center will manufacture sealed source material for internal consumption and for export. By the end of the third year, the income generated by sales of this material will have returned the initial investment, they said.

As for the radioisotope production reactor, they reported that it will produce material for medical and industrial use, and that it will be used to separate primary radioisotopes and carry out nuclear and biological control processes.

After explaining that the center will be built in the vicinity of the Embalse Nuclear Plant, the technicians said the implementation of the project might begin by the end of the year and that its completion would take approximately 5 years. They pointed out that it will be financed with the CNEA's own resources.

CSO: 5100/2146

BRIEFS

CNEA RESIGNATIONS--Buenos Aires, 23 Jul (NA)--It was learned today from reliable sources that two directors, a manager, and a specialist in nuclear plants, in addition to researchers and technicians, have in recent weeks resigned their posts at the National Atomic Energy Commission [CNEA] and most of them have left the country to seek better job opportunities. Among the most recent resignations at the CNEA are those of Jorge Bertoni, director for nuclear plants, who went to work abroad; and that of Alejandro Placer, director for planning, coordination, and control, who was hired by the International Atomic Energy Agency (IAEA) to work in its Vienna headquarters. Jorge Coll, former president of the Argentine Nuclear Enterprise for Electrical Power Plants (ENACE), which is subordinate to the CNEA, has also resigned and joined the IAEA. The resignation of Aristides Dominquez as manager for human resources stands out among other resignations reported at the CNEA in recent weeks. The CNEA faced a crisis in August 1984, when most of its directors tendered their resignations to CNEA President Alberto Constantini, who did not accept them. The departure from the country of CNEA experts is taking place at a time when the government is making efforts to repatriate Argentine scientists residing abroad. [Text] [Buenos Aires NOTICIAS ARGENTINAS in Spanish 2050 GMT 23 Jul 85 PY]

LAPENA ON NUCLEAR ENERGY--Buenos Aires, 23 Jul (NA)--Jorge Lapena, under secretary for energy planning, today stated that "nuclear energy will not play a major role in the production of electricity in the next 20 years," and admitted that "there is now an oversupply of electricity as a result of the drop experienced by the Argentine gross domestic product [GDP] in the past decade." Lapena made this statement in a luncheon given by the Petroleum Club at the Plaza Hotel. The luncheon was attended by Shell Vice President Paez Allende, Esso Vice President German Salazar, Bridas representative Alejandro Bulgheroni, and others. Lapena said the drop in the demand for electricity "stems from the zero growth of the Argentine GDP during the past decade due to a regression of the Argentine economy." Lapena said that at present hydroelectrical power accounts for 45 percent of the national power resources and that nuclear plants only supply 11.5 percent of the electricity used in the nation. He announced that natural gas will have to be used in the future for the production of electricity. Lapena noted that "there is now a short supply of gas due to our inadequate pipeline systems," and that there was a 5 percent drop in the production of oil during the first half of 1985 compared to the same period of 1984. In this regard, Lapena said that "the level

of oil reserves remains unchanged" and warned that "if a serious effort is not made in this sector, Argentina will no longer be able to have sufficient oil for its own consumption." [Excerpt] [Buenos Aires NOTICIAS ARGENTINAS in Spanish 2008 GMT 23 Jul 85 PY]

NUCLEAR SCIENTISTS' EXODUS DENIED--Buenos Aires, 24 Jul (TELAM)--The National Atomic Energy Commission [CNEA] today denied press reports that two CNEA directors have decided to leave the country in an alleged exodus. The CNEA reported that the two scientists are enjoying a leave without pay to work for the International Atomic Energy Agency, a normal activity. In a communique, the CNEA stated that proof of this is the recent return to the country of an Argentine expert, who now holds the post of director of planning, coordination, and control. Moreover, these scientists had already spent lengthy periods abroad, either on missions or contracts authorized by previous governments. The CNEA adds that hundreds of scientists and technicians are abroad updating and increasing their knowledge and providing their expertise and experience to the country through this commission, without accepting posts in nuclear organizations of other countries, thus maintaining and increasing the outstanding Argentine position in the nuclear field. The CNEA communique concluded by saying that a similar situation is occurring with an expert in chemistry and a CNEA director. [Text] [Buenos Aires TELAM in Spanish 0514 GMT 24 Jul 85 PY]

CSO: 5100/2149

BRAZIL

COMMENTATOR VIEWS REAGAN-GORBACHEV MEETING

PY100345 Sao Paulo Radio Bandeirantes Network in Portuguese 0230 GMT 10 Jul 85

[Commentary by Newton Carlos]

[Text] There are great expectations throughout the world, but especially in Europe and the United States, regarding the preparations for the summit conference between U.S. President Ronald Reagan and the new Soviet leader Mikhail Gorbachev.

This conference will be held in November, but Gorbachev's strategy has already been established. He will reportedly try to convince Reagan that the detente experience of the 1970's must be exploited, not only to establish detente, but to make it more dynamic and to have it function as an instrument capable of changing a world armed to the teeth into an international security system.

However, the Soviets have imposed a condition: Strategic balance must prevail. Both Soviet and U.S. arsenals should have equal destructive power. This is the main reason for the Soviets to demand that the U.S. star war program be pigeonholed. They claim that this program is destabilizing, and that it upsets the strategic balance achieved with great sacrifice by the Soviets.

CSO: 5100/2142

BRAZIL

PUGWASH MEETING CABLES SARNEY, REAGAN, GORBACHEV

PY112143 Rio de Janeiro O GLOBO in Portuguese 10 Jul 85 p 19

[Text] Campinas, Sao Paulo--Hundred scientists from 60 countries who participated in the week-long 35th meeting of the Pugwash Movement have sent a telegram to President Jose Sarney suggesting that Brazil and Argentina sign a pact restricting nuclear development in Latin America, and that all countries of the continent support the Tlatelolco Treaty. The scientists also sent telegrams to U.S. President Ronald Reagan, and to CPSU Central Committee General Secretary Mikhail Gorbachev asking them to examine at their November summit not only the problems that affect the two major powers in particular, but also those that affect all the continents.

Copies of the document written at the Pugwash Movement meeting are being mailed to Sarney, Reagan, and Gorbachev. In the document, the scientists question the proliferation of nuclear weapons, the arms race in Latin America, the foreign debt as a factor of social and political instability, the Malvinas issue, and the problems in southern Africa.

CSO: 5100/2142

FRG MINISTER URGES CONSTRUCTION OF SECOND NUCLEAR PLANT

LD270909 Hamburg DPA in German 2239 GMT 26 Jul 85

[Excerpts] Sao Paulo, 26 Jul (DPA) -- Federal Minister for Economic Cooperation Juergen Warnke has called on Brazil to change its protective policy on the information technology industry. At the end of his 4-day visit to Brazil today, Warnke described the protective measures to the press in Sao Paulo as a mistaken legislative decision. He hoped Brazil would amend it. The law on information technology forbids foreign firms from producing microelectronics products in Brazil.

Warnke said the law on information technology hampered new German investment in Brazil. In order to bring foreign investment to Brazil the country should also make it clear that it intends to pay its debts. Warnke suggested to the Brazilians that not just one, but two, nuclear power stations should be set up in cooperation with German industry. Until now it was only certain that the Brazilian Government would complete one German nuclear power station (Angra Two). The German-Brazilian nuclear treaty concluded in 1975 originally planned for the construction of eight German nuclear power stations. Due to its economic and financial crisis however, Brazil has no more money to carry out these plans. Warnke flew from Sao Paulo to Peru for a several-day visit.

CSO: 5100/2155

GOVERNMENT TO REVIEW NUCLEAR AGREEMENT WITH FRG

PY160236 Rio de Janeiro O GLOBO in Portuguese 12 Jul 85 p 17

[Text] Mines and Energy Minister Aureliano Chavez yesterday announced that the Brazilian nuclear program and the construction of more than five nuclear plants, established in an agreement with the FRG, will be reviewed by a high-level commission made up of representatives of the government and the Brazilian scientific community.

After meeting with President Jose Sarney at Planalto Palace, Aureliano Chavez reported that the nuclear program will be reexamined in view of the country's economic situation.

The commission, to be established in the next few days, will be coordinated by the Mines and Energy Ministry and will have 120 days to make the study. According to the mines and and energy minister, one point has already been decided: The investment in the nuclear program will be reduced but the Angra II and III nuclear plants must be concluded.

CSO: 5100/2143

SETUBAL QUESTIONS USSR'S NUCLEAR TEST SUSPENSION

PY302336 Paris AFP in Spanish 2205 GMT 30 Jul 85

[Text] Brasilia, 30 Jul (AFP) -- Brazilian Foreign Minister Olavo Setubal today expressed an implicit doubt regarding the suspension of nuclear tests proposed by the USSR, because there is a lack of knowledge regarding the effects of the explosions that are carried out for peaceful purposes. Setubal granted a press conference today, upon arriving at the Brasilia Air Force Base on his return from Lima, where he participated in the inaugural ceremonies of the new Peruvian president, Alan Garcia.

Mikhail Gorbachev, the secretary general of the USSR Communist Party, has announced a unilateral suspension of nuclear tests as of 6 August 1985 and has invited the United States to adopt a similar position. The United States has rejected the Soviet offer.

Setubal believes that the measure must be studied from a technical viewpoint. At this time, and without consulting experts, I cannot say whether that measure will contribute to the peaceful development of nuclear energy, Setubal added.

Brazil has not adhered to the Non-Proliferation of Nuclear Arms Treaty because it considers it to be discriminatory, but has signed the Tlatelolco Treaty that denuclearizes Latin America, although Brazil has not yet ratified it.

The foreign minister highlighted President Francois Mitterrand's reply to a letter that was addressed to all the chiefs of state of industrialized nations by Uruguayan Foreign Minister Enrique Iglesias in his role as secretary pro tempore of the Cartagena Consensus. In the letter Iglesias asks for the understanding of the industrialized nations regarding the economic problems of Latin America. The French president's answer was one of understanding, Setubal said. The other answers were conventional.

Setubal also indicated that Argentina, Brazil, Peru, and Uruguay have offered more cooperation to the Contadora Group and its efforts to achieve peace in Latin America.

CSO: 5100/2155

URANIUM TO BE ENRICHED BY JET-NOZZLE PROCESS BY 1989

PY311814 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 24 Jul 85 p 21

[Text] Rio de Janeiro -- Nuclebras president Licinio Seabra stated yesterday that by early 1989, Brazil will be in a position to enrich uranium through the jet-nozzle process, and will then be able to assess the country's interest, taking into account that this is the most expensive process.

After lecturing to officers of the Naval War School, Seabra stated that NUCLEI [Nuclebras Istotope Enrichment, Inc.], a Nuclebras subsidiary, "is mounting the first pilot cascade which is already being mounted on an industrial scale, so as to assess the performance of the jet-nozzle process for enriching uranium isotopes."

"This is the first stage of the pilot plant. We are in the final stage of that plant, which will begin operating in the second half of 1986. Then we will have an observation period of 1 or 1 1/2 years, in order to be able to make an assessment afterwards of all the aspects of the operations system," Seabra added.

He admitted that the "jet-nozzle process is the most advanced system for the enrichment of uranium, but it is more expensive than the other two systems available today in those countries that have already obtained the enrichment process." According to Seabra, the countries that have it "do not want to transfer them to Brazil or other countries."

The Nuclebras president added that should a decision be made to install the enrichment process at industrial level, a period of 3 years would be needed for the production of enriched uranium and for other investments.

"But this is a decision that has not yet been made and it will depend on a strategic assessment that could be made upon the conclusion of the first stage of the pilot plant, which could take place by the end of 1988 or the beginning of 1989," Seabra stated.

Without taking a position for or against the continuation of the nuclear plant Angra III, (it has been paralyzed), the Nuclebras president stated that $500 million were already invested in that project.

Seabra added that he has kept the copy to O ESTADO DE SAO PAULO to read the report in which the German magazine DER SPIEGEL reports that the nuclear agreement

signed by Brazil 10 years ago with the FRG resulted "in nothing for Brazil," and that he is going to read it at night. He said that the agreement already allowed for the training of Brazilian experts, whether engineers or technicians, and cited NUCLEP [Nuclebras Heavy Equipment, Inc.], another subsidiary of Nuclebras, as one of the positive results of the agreement. He also cited the fact that NUCLEP has own the bid for the construction of Argentina's Atucha, Nuclear Plant and NUCLEP's participation in the bids called for by Egypt and Turkey for the production of nuclear reactions in association with the German Kraftwerk Union.

CSO: 5100/2158/F

BRAZIL

ANNUAL REPORT OF IPT OF SAO PAULO

Sao Paulo GAZETA MERCANTIL in Portuguese 22 Apr 85 p 27

[Text] Sao Paulo Institute of Technological Research, S. A. (IPT)

Board of Directors: Milton Vargas, president; Victor Manoel de Souza Lima, vice president; Talmir Canuto Costa, Aerospace Technical Center, Ministry of Air; Naval Commander Jorge Pinheiro da Costa Veiga, Naval Engineering Board, Ministry of Navy; Hessel Horacio Cherkasski, Secretariat of Industry, Commerce, Science and Technology; Jose Ephim Mindlin, Sao Paulo State Federation of Industry; Saul Goncalves d'Avilla, Secretariat of Industry, Commerce, Science and Technology; Plinio Oswaldo Assmann, Engineering Institute; Walter Borzani, State Science and Technology Council; Jose Rossi Junior, Secretariat of Industry, Commerce, Science and Technology; Celso Pinto Ferraz, Secretariat of Industry, Commerce, Science and Technology; and Clovis Bradaschia, University of Sao Paulo Polytechnical School.

Supervisory Board: Vilmar Evangelista Faria, Eduardo Pinheiro Gondin Vasconcelos, and Luis Antonio Siquiera Reis Dias.

Executive Board: Dr Milton Vargas, president; Dr Victor Manoel de Souza Lima, vice president; Dr Alberto Pereira de Castro, superintendent; Dr Carlos de Souza Pinto; and Dr Paulo Cesar Leone.

Message to the Stockholders and the Public

In 1984, the attention of the Executive Board of the IPT was focused on the maintenance of the human and material assets of the institute, for the purpose of safeguarding them with a view to more effective technological support of Brazilian industry in this developing phase.

At the end of the year, the IPT had 746 researchers, 1,038 technicians, 694 administrative employees and 208 assistants, making a total of 2,686 permanent employees, 1,120 of them with university level education.

During the year, 26 completed their masters programs and six obtained doctorates, such that by the end of the year 172 technicians had postgraduate training. The apprenticeship program accepted 432 university students.

However, the IPT lost 50 university-level technicians, basically for salary reasons, and fears the loss of some others. This development has weakened its chief asset, which took years to train and has cost the institute and state so much.

In accordance with State Law 3741, the employee participation system was established, such that this group has a representative on the board.

As to the physical assets, the investment of resources continued to be limited, falling far below the minimal requirements and even threatening the maintenance of some laboratories. The total expenditures came to 2,649,000,000 cruzeiros, including state subsidies and specific financing, mainly from the FINEP [Funding Authority for Studies and Projects].

Despite the recessive atmosphere, the IPT received contracts for the execution of 354 new projects, and at the end of the year, it had 455 projects under way, in addition to having completed thousands of tests and analyses in its 89 laboratories.

The income obtained from services rendered came to 30.6 billion cruzeiros. Of this total, 15 percent pertained to services rendered to the Secretariat of Industry, Science, Commerce and Technology (SICCT), 14 percent to services rendered to other state administrative bodies, 32 percent to services rendered to federal administrative bodies, 2 percent to services rendered to municipal administrations, 2 percent to services rendered to the bodies of other states in the federation, 30.5 percent to services rendered to private enterprise, and 3.5 percent to minor and miscellaneous services. Thus a percentage increase in contracts with private bodies was noted, since in earlier years they accounted for 20 percent of the income.

The SICCT projects were focused on the priorities of that body, in connection with domestic technology for enterprises, support of micro, small and average enterprises, support of the municipalities, alternative energy sources and development of the mineral sector.

Among the projects carried out for Sao Paulo state government bodies, special mention is merited by those done for the CESP [Sao Paulo Electric Power Plants, Inc.], ELETROPAULO, SABESP, DER [Highway Department], DAEE [Water and Electric Power Department] and METRO. Important work for the federal government included that done for PETROBRAS [Brazilian Petroleum Corporation], PETROMISA, Rio Doce Valley Company, RFFSA, ALBRAS [Brazilian Aluminum, Inc.], EBTU [Brazilian Urban Transportation Company], COSIPA [Sao Paulo Iron and Steel Company], ELETRONORTE [Northern Electric Power Plants], NUCLEBRAS [Brazilian Nuclear Corporations, Inc.], NBH [National Housing Bank], IBDF [Brazilian Forestry Development Institute], SUDHEVEA [Superintendency of the Rubber Industry], EMBRATEL [Brazilian Telecommunications Company], EMBRAPA [Brazilian Agriculture and Livestock Research Enterprise, the Ministries of Navy, Army and Air, and the FINEP. This latter agency has confirmed its position as the main financer of IPT projects, with nine contracts. Outstanding among these are the work pertaining to the Program for Aid to Industry in Energy Conservation, with the participation of the National Council for Petroleum and the FIESP [Sao Paulo State Federation of

Industries], and, with PME-FINEP resources, continuation of the babacu palm development project at the Teresina experimental unit in Piaui. The IPT projects also obtained financial support from the STI [Secretariat for Industrial Technology]-MIC [Ministry of Industry and Commerce], the FIPEC of the Bank of Brazil and the PADCT [Support Program for Scientific and Technological Development], and, in the international sector, from the Itamaraty Palace, the SUBIN and the FUNDAP.

For the municipal government, projects involving low-cost paving, soil use, assessment of housing complexes, hydraulic earth-filling and the use of reforestation woods for low-cost housing were carried out. Projects for other state governments were executed in Parana, Rio de Janeiro and Goias, in addition to other services rendered in various regions of Brazil.

In the private sector, the work done was focused no three main areas: nationalization of equipment, components and materials, development projects, and technological support. Notable work was done in blast welding, precision casting, the production of metal powders and parts of aluminum oxide and aluminous porcelain, the production of odometers, extra-soft steel, cast iron parts with a high silicon content, wood processing, instrumentation equipment, the use of niobium in alloys, description of magnetite rejection, the uses of aluminum in medium-sized vessels, the handling of propellants, off-shore platforms, continuous biodigestion, rust-resistant materials, tempering glass, microcomputer hardware, the development of catalysts, geotechnics, the monitoring of drilling and setting of stakes, the cementing of oil wells, the testing of railroad parts and various tests on metals. With the participation of the INPI [National Institute of Industrial Property], the development contracts with Eternit and Sama were continued, and a similar contract was signed with Pirelli.

Also in 1984, the institute published 34 periodicals and 246 serial publications. It organized nine seminars and symposiums in which about 700 individuals participated. The Specifications Section received about 19,000 inquiries concerning its archive of about 230,000 technical norms, and, finally, the library received 7500 requests for information from businesses interested in subjects related to technology. The institute applied for 11 new patents and another three were granted by the INPI, all of them pertaining to technological innovation projects.

As to the economic and financial aspect, the operational results for 1984 can be summarized in the following figures:

	Millions of Cruzeiros
Net recorded operational income	38,943
Subsidy from state government	29,823
Net recorded operational expenditures	75,695
Operational deficit	6,927

If the expenditures of the Paulipetro Consortium, totaling 8,315,000,000 cruzeiros, are deducted, and a comparison is made with the past 2 years, we have:

	Millions of Cruzeiros		
	1982	1983	1984
Own income	9,726	14,414	30,628
State subsidy	4,006	9,743	29,823
Operational expenditures	14,142	26,927	67,380

With the deduction of 3.94 billion cruzeiros for depreciation, in accordance with the model established by the Board of Directors, it will be seen that the institute's own income covered 40 percent of the operational expenditures for the year 1984.

The balance statement also contains figures pertaining to Paulipetro, and with those figures deducted, we have the following:

	Millions of Cruzeiros	
	1983	1984
Current assets--accounts receivable	2,824	6,193
Current liabilities--suppliers	1,409	4,136

The economic situation of the IPT is expressed below in the index of current liquidity (current assets in relation to current liabilities) and the index of indebtedness (total owed in relation to net assets). To allow a better assessment of the accounts, these indices are also shown in terms of the adjusted figures, which exclude the sums pertaining to Paulipetro.

	1983	1984
Current Liquidity Index		
--with total figures	0.61	0.47
--with adjusted figures	0.40	0.39
Index of Indebtedness		
--with total figures	3.37	1.55
--with adjusted figures	2.72	1.10

BALANCE STATEMENT AS OF 31 DECEMBER 1984 AND 1983
(in thousands of cruzeiros)

Assets

	1984	1983
Current		
Cash bank funds	1,488,568	931,636
Accounts receivable	12,577,816	11,524,828
Special and compulsory deposits	179,251	84,222
Stocks	588,159	165,370
Advance payments	2,659	8,290
	14,836,453	12,714,346
Long-term		
Special and compulsory deposits	454,689	152,572
	454,689	152,572
Permanent		
Investments	103,581	30,186
Fixed	100,034,705	32,259,433
	100,138,286	32,289,619
	115,429,428	45,156,537

Liabilities

	1984	1983
Current		
Suppliers	7,918,458	8,101,848
Loans and financing	6,402,775	2,290,944
Wages and contributions	5,245,044	4,076,111
Provision for general expenditures	2,744,920	1,465,458
Customers' advance payments	2,062,294	666,862
Provisions for wages and taxes	4,973,933	1,791,598
Provisions for interest and correction on loans	1,358,693	1,744,400
Other accounts payable	547,758	389,585
	31,253,875	20,526,806
Long-term		
Loans and financing	38,526,246	14,083,198
Other accounts payable	519,359	228,915
	39,045,605	14,312,113
Net assets		
Capital	35,504,600	13,516,947
Capital reserves	78,736,471	21,895,779
Cumulative losses	(91,451,626)	(25,918,094)
	22,789,445	9,494,632
State allocation for increasing capital	22,340,503	822,986
	45,129,948	10,317,618
	115,429,428	45,156,537

Appended explanatory notes are an integral part of the financial statements.

Statement of Changes in Liquid Assets as of the Fiscal Years Ending 31 December 1984 and 1983 (in thousands of cruzeiros)

		Capital Reserves			
	Capital	Monetary Adjustment on Capital	Allocation for Investment	Special Monetary Correction	Total
31 Dec 1982 balance	6,127,816	5,990,771	16,786	268,158	6,275,715
Increase in capital	7,389,131	(5,990,770)	--	--	(5,990,770)
State allocation for future increase in capital	--	--	--	--	--
Compensation for cumulative losses	--	--	--	--	--
Monetary correction on net assets	--	21,164,667	26,285	419,882	21,610,834
Losses for the period	--	--	--	--	--
31 Dec 1983 balance	13,516,947	21,164,668	43,071	688,040	21,895,779
Increase in capital	21,987,653	(21,164,667)	--	--	(21,164,667)
State allocation for future increase in capital	--	--	--	--	--
Monetary correction on net assets		76,431,482	92,719	1,481,158	78,005,359
Losses for the period	--	--	--	--	--
31 Dec 1984 balance	35,504,600	76,431,483	135,790	2,169,198	78,736,471

	Adjusted Net Assets of the Self-Governing Body	Cumulative Losses	State Allocation	Total
31 Dec 1982 balance	368,184	(6,355,217)	1,398,361	7,834,859
Increase in capital	--	--	(1,398,361)	--
State allocation for future increase in capital	--	--	509,329	509,329
Compensation for cumulative losses	(704,985)	704,985	--	--
Monetary correction on net assets	316,801	(9,673,936)	313,657	12,567,356
Losses for the period	--	(10,593,926)	--	(10,593,926)
31 Dec 1983 balance	--	(25,918,094)	(822,986)	10,317,618
Increase in capital	--	--	(822,986)	--
State allocation for future increase in capital	--	--	18,044,220	18,044,220
Monetary correction on net assets	--	(55,794,422)	4,296,283	26,507,220)
Losses for the period	--	(9,739,110)	--	(9,739,110)
31 Dec 1984 balance	--	(91,451,626)	22,340,503	45,129,948

Appended explanatory notes are an integral part of the financial statements.

Explanatory Notes for the 31 December 1984 Financial Statements

Note 1--Summary of the Main Accounting Practices

The financial statements are drafted and presented in accordance with the provisions set forth in Law No 6404/76 and the tax legislation in effect.

The effects of inflation on the financial statements are incorporated by means of the monetary correction shown on the records of the permanent and net assets, in which the state allocation for a future increase in capital is included, such that the net result of these corrections is incorporated in the results for the period.

The other assets and liabilities requiring correction or adjustment because of exchange variations are also corrected, and in the same way, the respective results are integrally incorporated in the statement of the results for the period.

The provision for uncollectible debts was established on the basis of an individual analysis of the credit sums owed, and is regarded as adequate to cover possible losses.

Stocks are shown at average purchase cost, which is lower than replacement cost.

Fixed assets are shown at corrected cost. Depreciation is calculated by the linear method, using the maximal rates allowed by the fiscal legislation, except for buildings, to which the rate of 2 percent per year is applied.

Note 2--Accounts Receivable

	1984 In Thousands of Cruzeiros	1983 In Thousands of Cruzeiros
Customers	10,182,878	9,960,509
Minus:		
Provision for uncollectible debts	384,804	230,216
Expected invoicing	239,635	88,665
	9,558,439	9,641,628
Receipts to be billed	2,473,324	1,192,523
Subsidy from state government	--	399,650
Other accounts receivable	546,053	291,027
	12,577,816	11,524,828

Note 3--Fixed Assets

(in thousands of cruzeiros)

	Corrected Cost		Cumulative Depreciation		Net	
	1984	1983	1984	1983	1984	1983
(1)	25,384,872	8,051,735	--	--	25,384,872	8,051,735
(2)	37,796,715	11,056,326	4,641,355	1,236,307	33,155,360	9,820,019
(3)	42,625,641	11,756,775	23,124,359	5,987,947	19,501,282	5,768,828
(4)	7,119,130	1,113,699	2,326,028	535,211	4,793,102	578,488
(5)	4,828,781	1,489,900	2,941,377	784,542	1,887,404	705,358
(6)	1,228,258	763,851	--	--	1,228,258	763,851
(7)	16,532,567	7,221,133	2,448,140	649,979	14,084,427	6,571,154
	135,515,964	41,453,419	35,481,259	9,193,986	100,034,705	32,259,433

Key:

1. Land
2. Structures
3. Machinery, parts and equipment
4. Installations
5. Furnishings and tools
6. Work in progress
7. Other

Note 4--Loans and Financing

	1984 In Thousands of Cruzeiros	1983 In Thousands of Cruzeiros	Annual Obligations	Form of Amortization	Due Date
Domestic					
BADESP*	6,746	9,199	4% + 40% ORTN**	Quarterly	1987
FINEP	1,733,623	750,267	2% to 12%***	Monthly and Quarterly	1996
Bank of Brazil	110,366	78,098	18%	Annual	1989
	1,850,735	837,564			
Foreign					
BID****/FINEP ($4,894,200 in in 1984 and $5,438,000 in 1983)	15,583,133	5,350,992	3%	Semiannual	1993
BID-FINEP-CEFER ($2,547,412 in 1984 and $2,751,205 in 1983)	8,110,961	2,707,186	8.6%	Semiannual	1997

	1984	1983	Annual	Form of	Due
	In Thousands of Cruzeiros		Obligations	Amortization	Date
BANESPA ($1,336,000)	4,253,824	1,968,000	libor + 1.75%	Semiannual	1988
BANESPA ($416,000)	--	409,344	libor + 2.25%	One time	1984
BANESPA ($4,752,000)	15,130,368	5,101,056	libor + 2.25%	Semiannual	1990
	43,078,286	15,536,578			
	44,929,021	16,374,142			

* Sao Paulo State Development Bank
** National Treasury Readjustable Bonds
*** Monetary correction = 10 percent to 60 percent of the ORTN
**** Inter-American Development Bank

	Domestic		Foreign		Total	
	1984	1983	1984	1983	1984	1983
Short-term	214,375	67,505	6,188,400	2,223,439	6,402,775	2,290,944
Long-Term	1,636,360	770,059	36,889,886	13,313,139	38,526,246	14,083,198
	1,850,735	837,564	43,078,286	15,536,578	44,929,021	16,374,142

The loans and financing are guaranteed by the Sao Paulo State Treasury.

Note 5--Capital

The capital is distributed in 35,504,600,207 registered ordinary stocks (13,516,947,031 in 1983) with a nominal value of one cruzeiro each, of which 35,504,392,496 belong to the State Treasury (13,516,866,314 in 1983).

Note 6--Nonoperational-Financial Expenditures (Income)

These are presented in this accounting section because they are not factors included in the price of services rendered, but result from loans which will be paid out of specific future capital contributions.

Note 7--CESP-IPT Consortium Operations

In accordance with the agreement signed with the CESP on 7 December 1979, the CESP-IPT Consortium was established with a view to the provision of oil field prospecting, assessment and development services.

The operations of the consortium involving the direct participation of the IPT are shown in its financial statements. The expenditures resulting from these operations are reimbursed by the government of the state of Sao Paulo through the Secretariat of State for Industry, Commerce, Science and Technology.

On 5 May 1983, the operational activities of the consortium were halted. It is now engaged in negotiations with the suppliers and other creditors with a view to the settlement of accounts.

Sao Paulo, 20 February 1985

Engineer Alberto Pereira Castro, superintending director; Engineer Carlos Sousa Pinto, director; Engineer Paulo Cesar Leone, director; and Jose Roberto Pissiguelli, accountant (CRC 116,193-SP).

Statement of Account for the Periods Ending
31 December 1984 and 1983
(in thousands of cruzeiros)

	1984	1983
Gross operational income		
Services rendered	27,641,862	17,547,193
Product sales	3,359,232	1,149,407
Services rendered--SICCT	5,604,961	1,760,881
Other	2,609,032	1,161,060
	39,215,087	21,618,541
Less returns and discounts	271.710	49,607
Net operational income	38,943,377	21,568,934
Direct cost of services rendered and products sold	49,357,746	25,436,373
Operational margin	(10,414,369)	(3,867,439
Operational Expenditures		
Personnel	20,547,635	7,595,373
Services of third parties	950,204	319,628
Depreciation (deductions of 3,305,681 cruzeiros in 1984 and 850,273 cruzeiros in 1983, on approximate cost)	634,221	318,836
Materials and supplies	1,112,564	393,437
Other	3,093,242	1,043,177
	26,337,866	9,670,451
Other income		
Budget economic allocations	29,823,883	10,767,731
Operational losses	(6,928,352)	(2,770,159)
Nonoperational financial expenditures (deductions of 21,604,424 cruzeiros in 1984 and 354,983 cruzeiros in 1983 from income)	(45,956,157)	(15,156,009)
Other	--	(26,994)
Monetary correction on permanent and net assets	43,145,399	7,359,236
Net losses for the period	(9,739,110)	(10,593,926)
Losses per share of company capital (calculated on the basis of the number of shares at the end of the period)	0.03 cruz.	0.08 cruz.

Appended explanatory notes are an integral part of the financial statements.

Statement of Origin and Use of Resources for the Periods Ending on 31 December 1984 and 1983
(in thousands of cruzeiros)

	1984	1983
Origin of resources		
From shareholders		
State allocation for future increase in capital	18,044,220	509,329
From third parties		
Long-term financing and loans	296,030	559,001
Other	6,582	20,973
Total	18,346,832	1,089,303
Use of resources		
In operations		
Net losses for the period	9,739,110	10,593,926
Less charges not representing resources paid out:		
Depreciation of fixed assets	3,939,902	1,169,109
Exchange variations and monetary corrections on long-term debts	26,139,553	10,175,042
Plus income not representing resources acquired:		
Monetary correction on permanent and net assets	43,145,399	7,359,236
Other	4,730	(3,724)
	22,809,784	6,605,287
On permanent assets		
Purchase of fixed assets	2,137,801	657,753
For other purposes		
Liabilities transferred from long-term to current status	2,002,401	463,668
Increase in long-term prospects	1,808	7,420
	2,004,209	471,088
Total	26,951,794	7,734,128
Reduction in current capital	8,604,962	6,644,825

	End 1984	End 1983	Beginning 1983	1984	1983
Current assets	14,836,453	12,714,346	7,233,453	2,122,107	5,480,893
Current liabilities	31,253,875	20,526,806	8,401,088	10,727,069	12,125,718
Current capital	16,417,422	7,812,460	1,167,635	8,604,962	6,644,825

Appended explanatory notes are an integral part of the financial statements.

Opinion of the Supervisory Board

The members of the Supervisory Board of the Institute of Technological Research of the State of Sao Paulo, S.A. (IPT), pursuant to their legal and statutory authority, have examined the balance sheets, the pertinent

statements of results, the changes in net assets and the origin and use of resources, as well as the related explanatory notes, as of the close of 31 December 1984, set forth in accordance with generally accepted accounting principles. Based on this examination and an analysis of the monthly balance sheets, as well as the opinion of the independent auditors dated 20 February 1985, they believe that said statements adequately reflect the economic-financial-asset situation of the institute, in suitable condition for submission to and assessment by the shareholders.

Sao Paulo, 25 March 1985

Eduardo Pinheiro Gondim Vasconcelos
Luis Antonio Siqueira Reis Dias
Vilmar Evangelista Faria

Opinion of the Auditors

To the Directors of the Institute of Technological Research of the State of Sao Paulo, S. A. (IPT):

1. We have examined the balance statement of the Institute of Technological Research of the State of Sao Paulo, S. A. (IPT) struck as of 31 December 1984, and the related statements of results, the changes in net assets and the origin and use of the resources during the fiscal period ending on that date. Our examination was carried out in accordance with generally accepted auditing standards and, as a result, included verification of the accounting records and other auditing procedures we deemed necessary under the circumstances.

2. Earlier, we examined and issued our opinion on the financial statements for the fiscal period which ended on 31 December 1983, and these figures are submitted for purposes of comparison.

3. In our opinion, the financial statements to which the first paragraph refers adequately reflect the status of the assets and finances of the Institute of Technological Research of the State of Sao Paulo as of 31 December 1984, the results of its operations, the changes in its assets and the origin and use of its resources for the fiscal period ending on that date, based on generally accepted accounting principles applied in consistent fashion with regard to the preceding fiscal period.

Sao Paulo, 20 February 1985, Boucinhas, Campos and Claro, S.C. (CRC.SP-5,528), Jose da Costa Boucinhas, accountant (CRC.SP-10).

5157
CSO: 5100/2127

SARNEY ON FRG ACCORD, ARGENTINA'S NUCLEAR INTENTIONS

PY022156 Brasilia Domestic Service in Portuguese 1840 GMT 2 Jul 85

[Press conference by President Jose Sarney with foreign reporters at the Gloria Hotel in Rio de Janeiro--live]

[Excerpts] [Reporter] Mr President, the nuclear agreement between Brazil and the FRG was signed 10 years ago. The initial project foresaw the construction of eight nuclear plants by 1990. It now seems that none of those plants will be completed by that date. I would like to know the priority you will attach to that contract, specifically if your government will proceed with the construction of the second plant that is part of the contract with the FRG.

[Sarney] The Brazilian nuclear program and, within it, the part related to the contract with the FRG, is caught up in the difficulties that the country faces. Therefore, it will be subject to some strategy modifications.

At the same time, we are not in a position at this time to implement it. So it is included among those sectors in which we have to make quite substantial cuts.

[Pierre Guitaud, French television] The French Government has invited Brazil to participate in the Eureka project, and the same government praised the new Brazilian policy. At your invitation, President Mitterrand will visit Brazil. How would you like this visit to develop, basically from the political and economic standpoints?

[Sarney] The operation of the Eureka project is still a declaration of intent by some sectors of the French Government. We all know that the Eureka project is a peaceful response to the "star wars" initiative. We expect that the visit of President Mitterrand to Brazil will serve to bring our peoples closer together and, at the same time, will serve as an opportunity to discuss some problems of common interest between France and Brazil. One such area is the foreign debt problem, which we hope to clarify from the point of view of the European creditors, the Paris Club. It should also be an occasion to think over the problems of the world, Central America, world peace, and disarmament. Summing up, it should be an occasion to exchange opinions between two countries that want to state their mature position on international issues.

[Horacio Jimenez, ANSA] Mr President, through a parallel or secret nuclear program, Brazil could be developing technology to manufacture an atomic bomb, just like Argentina. Would this not be a case calling for serious talks between statesmen of the two countries to return to the peaceful use of nuclear energy, thus preventing enormous unproductive expenditures and new internal or external military adventures?

[Sarney] We do not believe that Argentina wants to manufacture the atomic bomb. We do not have any program to manufacture the atomic bomb either. Our interest in harnessing the technology of the atom is exclusively related to its peaceful uses. As we all know, Brazil is not a country rich in fossil fuels.

We need to have access to the technology of the atom so that we can be in a position to make our most industrialized regions independent of energy shortages in the short term. We are signatories of the Tlatelolco Treaty through which Brazil is committed to a nuclear-free Latin America. We do not want Latin America to be involved in any sort of nuclear weapons deployment. This is our position, and it will be maintained. Latin America has the privilege of being the only part of the planet that is free of nuclear arsenals. We wish it to stay free forever.

CSO: 5100/2156

GOLDEMBERG CITES CAUSES, SOLUTIONS TO PROGRAM'S PROBLEMS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 17 Jul 85 p 22

[Article by Jose Goldemberg: "The Agreement, 10 Years Later (1975-1985)"]

[Text] Launched 10 years ago as a project of great impact, capable of profoundly altering the course of Brazilian energy policy, as well as making us a great power, the nuclear program conducted by Nuclebras, based upon the agreement with West Germany, is now in ruins.

The Figueiredo government 4 years ago had already begun to lose interest in the program, initiating other activities of nuclear technology outside the Nuclebras program.

Now the Sarney government, in cutting funds for the Angra III (and other nuclear reactors), has given the coup de grace to a poorly formulated and poorly conducted program that led the scientific community--the only one that could have made it a success--to direct confrontation with the Geisel government since 1975, with negative consequences for the nation's scientific development.

Collapse of a program of such magnitude, which was to install eight 1200-megawatt nuclear reactors by 1990 and another 20 or 30 reactors in the 1990-2000 decade, is due mainly to the following reasons:

1. Incorrect evaluation of the role that nuclear energy should play in Brazil, which is amply endowed with hydroelectric resources, advantageous from all points of view: economic, technical and environmental. The forecasts that the nation would need eight large nuclear reactors in the year 1990 were clearly incorrect, as Itaipu (and other hydroelectric facilities) will supply the needed energy, at least until the end of this century. The success of Itaipu is probably the major economic reason for the collapse of the nuclear program, having diverted funds and prestige away from it.

2. Incorrect evaluation of the technology chosen for uranium enrichment, without which adoption of nuclear energy will only increase dependency on fuel imports. After 10 years and after spending about $300 million, what was accomplished in the area of enrichment was a 24-stage pilot unit; should this pilot unit function satisfactorily--which seems unlikely--additional investments of about $3 billion would be needed.

This is the main point raised by the scientists from the beginning against the nuclear agreement, as the technology chosen was already controversial in 1975. The government argued at the time that the Germans were forced by the Americans to abandon the initial offer of granting the (much superior) ultracentrifuge technology. This was and continues to be a fundamental question, and the Brazilian Government, for this reason, should have broken off negotiations with the FRG or created a domestic research group to develop its own technology--which in fact was done as of 1981.

3. Technical errors and unsatisfactory management that greatly increased the costs of the Angra dos Reis II power plant (the first of the plants bought from Germany). Total Nuclebras investments have been $2.8 billion so far, plus a debt service of $1.2 billion, for a total of $4 billion, for which it has very little to show.

The main items for which these vast funds were spent are the following:

--Mineral exploration: $150 million;
--Manufacture of uranium concentrate (at Poço de Caldas): $260 million;
--Pilot enrichment plant: $300 million;
--NUCLEP [Nuclebras Heavy Equipment, Inc] (heavy-equipment plant in Itaguai): $300 million;
--Nuclear fuel plant (Rezende): $75 million;
--Technological training (for engineers): $275 million.

The rest was spent in operating the company itself, which has about 5,200 employees, and on the expensive facilities of Angra II, the equipment for which has all been bought in Germany.

One of the items on this list that particularly catches the eye is the cost of technological training: throughout the 10 years of Nuclebras' life, a few hundred persons at the most were trained, which means that each one of these must have cost the public coffers almost $1 million. This cost should be compared with what is spent on the National Council for Scientific and Technological Development [CNPq] to train the elite of the nation's researchers.

This is the result of 10 years of a grandiose project, that was characterized as such by the scientists of the SBPC [Brazilian Society for the Advancement of Science] at their 1975 meeting in Belo Horizonte.

According to its current president, Licinio Seabra, Nuclebras "lived in a world of fantasy (during these 10 years)."

How are we to leave this fantasy and try to solve the problems of the nuclear program created by Nuclebras?

One proposal discussed by President Tancredo Neves' COPAG [Committee for the Government Plan of Action] and that seems to have the support of the current Nuclebras management is a rapprochement with the electric sector (that is, ELETROBRAS [Brazilian Electric Power Companies, Inc.], with which Nuclebras tried to compete) and adoption of the French administrative model, which in Brazilian terms would be the following:

--Nuclebras would concentrate its efforts exclusively on the fuel cycle. The costs of installing the fuel cycle would be covered by a specific budget appropriation;

--The activities of nucleoelectric generation would remain in the electric sector, with an ELETROBRAS subsidiary being created for this specific and exclusive purpose. Angra I and II, as well as all the FURNAS [Furnas Power Companies, Inc] nuclear personnel, would be transferred to this company;

--NUCLEN [Nuclebras Engineering, Inc.] would become a subsidiary of the nucleoelectric generating company or else incorporated in it as a sector for coordinating engineering. The same thing could happen to NUCON [Nuclebras Nuclear Plant Construction, Inc], which, incidentally, is already in a process of liquidation.

The main disadvantage of this model is that of continuing to burden the finances of the electrical sector with the costs of facilities for nuclear generation.

Implementation of these ideas requires a policy decision, which so far has been made only implicitly through cutting Nuclebras funding.

Whenever speaking of revising the nuclear program and the nuclear agreement with the FRG, our government leaders always make ambiguous statements, such as those of President Tancredo Neves: "In regard to the commercial agreements resulting from the nuclear agreement, they will have to be examined and made compatible with the nation's economic capability." The Sarney government has in fact adapted the nuclear program to our economic circumstances, restricting it to construction of Angra II, but without reviewing the commercial agreements.

Tancredo Neves said further: "In reference to the specific agreement with the FRG, I think the most rational solution would be to retain it, making those revisions that our scientific and technical community is recommending to the government."

These recommendations are very clear and were summarized recently in a document published by the Brazilian Society of Physics:

1. Cancellation of the agreements to set up joint ventures between Nuclebras and the German companies headed by KWU.

2. Study the reorientation of the Nuclebras subsidiaries toward other productive activities.

3. Restructuring the sector of technological research and development in the nuclear area, strictly for peaceful purposes, meshing the CNEN [National Nuclear Energy Commission] and the research institutes with the universities, transferring CNEN and its institutes to the Ministry of Science and Technology.

4. Evaluate the nation's long-term nuclear-energy prospects, followed by establishment of a nuclear technology research and development plan, with the participation of various segments of society.

It is up to President Sarney to take a step forward in regard to what SEPLAN [Planning Secretariat] has done, ordering the restructuring of Nuclebras along the lines described above as a French managerial model.

This orientation would force renegotiation with the FRG authorities and the KWU (Siemens) group, inasmuch as the present subsidiaries of Nuclebras would have to be divided between Nuclebras and ELETROBRAS.

Experience shows that there is flexibility on the German side whenever it glimpses the possibility of continued purchases made in Germany and preservation of the diplomatic agreement that gave rise to the commercial agreements.

"The restructuring of technological research and development in the nuclear area, strictly for peaceful purposes" called for by the scientists can be achieved as part of this negotiation.

There would thus be ended 10 years of a bitter debate between government and scientists that was very educational for Brazilian society, because it prevented the errors that were committed in the nuclear area from being made in other important areas, such as informatics, computers, the aeronautical industry and others.

Collapse of the Nuclear Program from this point of view should be seen as a victory for the nation--and not just for its scientists.

8834
CSO: 5100/2154

BRAZIL

NUCLEBRAS HEAD SAYS PROGRAM'S FAILURE DUE TO LACK OF FUNDS

Uncertainty Marks Nuclear Program

Rio de Janeiro O GLOBO in Portuguese 27 Jun 85 p 23

[Text] "The world of fantasy has ended." That was the comment of the president of the Brazilian Nuclear Corporation (NUCLEBRAS), Licinio Seabra, on the Brazilian nuclear program, which is 10 years old today. In 1975, the Brazil-German program provided for the construction of eight atomic plants by 1990 to generate electric energy in the Southeastern Region. The then president of NUCLEBRAS, Ambassador Paulo Nogueira Batista supported the construction of 40 plants by the end of the century.

In these 10 years, Brazil spent $4 billion on the program and has a foreign debt of $2 billion. The first plant, Angra-II, has not yet been completed and Angra-III is on its foundations, $2 billion more being needed to complete it. On the date of its anniversary, the Brazilian nuclear program is uncertain. The government of the New Republic wants a plan for the turn of the century and is seeking to reconcile the shortage of funds with a pace of work that will make it possible to absorb the technology. The minister of mines and energy, Aureliano Chaves, admits that it will be necessary to renegotiate the agreement with the Germans.

The failure of the program is attributed by the president of NUCLEBRAS to the lack of definite financial support. Licinio Seabra believes that to carry forward the minimum program a sure source of funds that does not depend so much on German marks is essential.

"As it is, it is not viable, not realistic," he said.

Despite saying that it will be up to the Ministry of Mines and Energy and the Brazilian Electric Power Stations Corporation (ELETROBRAS) to decide the number of nuclear power stations to be built in the country, Licinio Seabra supports the construction of another plant to go into operation 2 years after the completion of Angra-II and III scheduled for 1991 and 1993. According to him, the plant, which should be begun next year at a still undetermined site, is necessary to preserve the engineering team and guarantee the process of absorption of technology.

Of the $4 billion already spent, $2.8 billion was invested in the first two plants and in the fuel cycle project. The remaining $1.2 billion pertain to the financial charges (interest and amortization.)

Licinio considers that in the past 10 years technology was absorbed in various phases of the cycle, as in the conversion of uranium concentrate, enrichment, reprocessing, mining, construction of heavy components and power plant engineering.

The fuel cycle projects already completed are the heavy components factory, NUCLEP, which costs $350 million; the plant for the production of uranium concentrate (yellow cake) in association with the French Pechiney Company; and the assembly part of the fuel elements factory. The demonstration plant of uranium enrichment by the jet-nozzle process developed jointly with Germany will be completed by the end of next year (it costs $300 million.) The construction of the industrial unit with a capacity to enrich uranium for three nuclear plants will cost $1 billion.

Seabra admitted that the creation of an ELETROBRAS subsidiary to build nuclear power plants and the privatization of NUCLEP are being studied. NUCLEBRAS would remain in charge of only the fuel cycle.

NUCLEBRAS Could Be Closed

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 28 Jun 85 p 3

[Editorial article: "In the World of Fantasy"]

[Text] NUCLEBRAS, which lived 10 years in the "world of fantasy", could be closed, its plant construction functions being transferred to ELETROBRAS while another small company would be in charge of the work connected with the enrichment of uranium. It would thus be possible to achieve considerable savings in a company that today has six subsidiaries, employs 5,200 persons with a payroll of $3.5 million a month and owes so much that it can only buy material, even the most simple material for daily use, by paying cash.

That is the picture of NUCLEBRAS drawn by its president, Engineer Licinio Seabra, who proposes its deactivation after 10 years' existence of the nuclear agreement signed with Germany, a period in which it lived in a "veritable fantasy world." NUCLEBRAS has already invested $2.8 billion but has a service of about $1.2 billion on the debt contracted in that country. NUCLEP's (one of its subsidiaries) equipment factory alone--imported to build nuclear reactors in Brazil when they were being deactivated throughout the world (including this one that was transferred here...)--cost $300 million and is practically at a standstill. Inside it, NUCLEBRAS stocks electronic equipment shipped by Germany for nuclear plants II and III valued at $3 billion, which Brazil received unwillingly because there is no prospect that it will be utilized.

A reading of Licinio Seabra's interview is cause for amazement and shows two important aspects of the disastrous results of the closed decisions by the military techno-bureaucracy, dominant in the last 21 years. First, the boldness with which public funds were committed, which, if the plans had gone ahead would have reached about $40 billion to generate unessential energy. Alongside that, one notes clearly in this case how the state machinery operates. Once the agreement with West Germany was signed, providing for the installation of eight plants, companies began to be created one after another--today six in number--with very expensive structures. Thus, 5,200 persons were employed the only production of which was bureaucracy, as our report from Rio said yesterday. Only the economic crisis through which the country pased--already perfectly foreseeable in 1975 when the nuclear agreement was signed inasmuch as we were going through the situation of the oil price explosion--prevented another similar number of companies from emerging and other thousands of employees from being contracted.

That is the way the state machine works in its zeal to generate nourishment to sustain itself.

After 10 years, the fantasy has ended. Fortunately, a single voice emerges in this New Republic, that of Licinio Seabra, preaching a belated conservation, which must begin with the closure of the company. Obviously, the transfer of its functions to ELETROBRAS, of which it would become only a department, should imply the draining of its staffs and expenses. There would be little point in merely swelling the electric energy holding company even further; it is already facing financial difficulties to carry out the minimum projects necessary for the domestic supply. Implicit in the proposal of the president of NUCLEBRAS is that it is not viable--like the nuclear program originally approved by General Geisel--and no longer has any reason to exist, just as the nuclear plants were not justified.

When we read that interview, we could not fail to ask if that is not the situation of a large number of the 422 state companies registered by the Special Secretariat of State Enterprises (SEST); actually, there are more than 500 in the federal area alone. How much could be saved by simply privatizing them or abolishing them, as Licinio Seabra proposes for the NUCLEP equipment factory, which competes with private industry? How many more, today a burden to the state, could be transferred to private hands?

In this order of reasoning, there is the satisfaction to see finally someone who belongs to the government staffs have the courage to make these exposures.

8711
CSO: 5100/2131

NUCLEBRAS TECHNICIANS DOUBT ANGRA-III WILL BE HALTED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 18 Jun 85 p 26

[Text] Brazilian Nuclear Corporation (NUCLEBRAS) experts declared in Rio yesterday that the complete suspension of the Angra-III nuclear plant project could represent losses to the country of approximately $1 billion already invested in works and equipment and another $900 million committed to commercial contracts with KWU. They do not believe that measure will be taken by the government and argue that there are other projects to be cut in the company's timetable.

The Angra-III project is still in the beginning stage; thus far, only the ground-leveling work and preparation of the project bed have been completed. Since the civil works have not yet begun, it may appear that it is easy to deactivate the project but, the experts ask: "What to do with the equipment stored in Itaguai, formerly stored in the port of Hamburg, Germany, and which cannot remain very long subject to the action of rust and sea air?"

The NUCLEBRAS experts warn that the manufacturer's guarantee period is 5 years and 70 percent of the Angra-III equipment is already stored in the Nuclebras Heavy Equipment Corporation (NUCLEP) in Itaguai awaiting assembly. The Brazilian Government must decide either to continue the civil works and make up the delay to put that plant into operation by the year 1992 or renegotiate with KWU to see if it will accept that equipment back.

In the opinion of the experts, what would be absurd would be to stop construction of Angra-III and let the equipment deteriorate through the action of time. There is very sophisticated electronic equipment, many turbines with very heavy shafts that can warp by being subjected for a long time to the force of inertia and must be submitted to periodic tests in maintenance plants. Because of a lack of funds, none of this is being done and the two plants, Angra-II and Angra-III, run the risk of giving as much trouble as is presently occurring with the Angra-I plant, if they go into operation.

Obviously, say the experts, it is not in the interest of KWU to expose itself to such safety and reliability risks because it has a market and a reputation to protect and it is already looking with misgivings at the headaches that the U.S. Westinghouse Company has been having with Angra-I.

Manifesto

In commemoration of the 10th anniversary of the Brazil-Germany nuclear agreement, the union of engineers of the state of Sao Paulo, of Rio Grande do Sul, the Regional Economic Council of Rio de Janeiro and the Association of Peace Studies yesterday released a manifesto that, in addition to condemning the errors committed calls for a reevaluation of the country's energy policy, asking also that the authorities of the New Republic fulfill the commitments assumed to adapt the nuclear agreement to the real needs of the country in terms of energy and technology without taking into consideration nepotism and other lesser interests.

In the opinion of the former director of the Nuclebras Engineering Corporation (NUCLEN), Joaquim de Carvalho, Brazil will not need nuclear energy until the first decade of the next century.

8711
CSO: 5100/2131

CHAVES DEFENDS ANGRA III CONSTRUCTION; EDITORIAL COMMENT

Ministry Cites Infrastructure

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 21 Jul 85 p 38

[Text] Brasilia--The Mines and Energy Ministry wants to retain--even if at a slower pace--the plan for constructing the Angra III nuclear power plant, which is included on the blacklist of government cuts. Mines and Energy Minister Aureliano Chaves has taken a position in support of Angra III with the argument that the plant is needed to keep the nation's infrastructure functioning until the years after 1990, when nuclear energy will become a necessity.

Forty percent of the equipment for Angra III, the second power plant of the Brazil-West Germany agreement, is either ready or on order and its foundations are finished. Investments of 46.8 billion cruzeiros are planned for this year, to build the construction shops and offices. If the project is interrupted, 40 billion cruzeiros must be spent for penalties and other personnel costs in deactivating the job.

It was 10 years ago, on 27 June 1975, that Brazil signed the treaty with West Germany. The intention was to construct eight nuclear power plants by 1990, with investments of $18 billion, including $13.8 billion for the power plants, $3.7 billion for the fuel-cycle units and $900 million for investment in technology. The first plant under this agreement, Angra II, is not likely to begin operation until 1991.

What actually happened was a complete revision of the initial grandiose plans, which further called for building 35 more nuclear plants by the year 2000 and the transformation of Brazil into a Third-World nuclear power, an exporter of power plants and enriched uranium.

So far, Brazil's nuclear program--which began in 1971 when the U.S. firm of Westinghouse was hired to build the first plant, Angra I--has consumed $5.8 billion, including $1.8 billion for Angra I, which is among the plants generating the world's most expensive energy--$2,875 per kilowatt--and the remaining $4 billion for the FRG program. Angra I did not enter operation until 14 years after it was begun, and even so it still depends upon investments of $300 million to operate with the necessary reliability.

Revision

The mines and energy minister intends to make a complete reevaluation, with the Germans, of the nation's nuclear-energy program, renegotiating its clauses that are now entirely obsolete in regard to power-plant construction and cutting corners in the technological area.

The greatest progress so far has been in this latter area: Brazil now produces uranium concentrate (yellow cake) and uranium hexafluoride (gas); it is beginning to test the "jet-nozzle" enrichment process this year; it produces fuel elements, 80 percent of engineering services and almost 100 percent of all heavy equipment for a nuclear power plant.

In this renegotiation, the minister is likely to propose cancellation of the two nuclear plants, Iguape I and II, that were contemplated to follow. The decision to build these plants will be made by President Sarney's successor, depending upon market conditions for electrical energy.

Aureliano also intends to completely revise the structure of Nuclebras, which will lose its Brazilian subsidiaries and become a department of ELETROBRAS [Brazilian Electric Power Companies, Inc], responsible for building nuclear plants. The only thing kept will be a nuclear technology enterprise in charge of developing the fuel cycle and specific process engineering.

With this liquidation, the government will take over the charges on a $2 billion debt and a domestic debt to banks and suppliers of about 400 billion cruzeiros. ELETROBRAS would become responsible for building Agra II by 1991 and Agra III, which according to what has been arranged, may be delayed by as much a 3 years, until 1994. To conclude both plants, another $1.9 billion will be needed, including $900 million for Angra II and $1 billion for Angra III. So far, $900 million has been spent on the first and $300 million on the second plant.

Doubts Expressed About Program

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 21 Jul 85 p 3

[Editorial: "Defending the Indefensible"]

[Text] There is a resurgence of an old idea for justifying unjustifiable projects: it is better to complete them, because to halt them at the current stage would be more expensive. This was used by the technocrats to go ahead with building USIMINAS [Minas Gerais Iron and Steel Mills, Inc.] and the Steel Railway and now, albeit timidly, is being advanced to force construction of the Angra III nuclear power plant. An argument (false, of course) often used is that a large part of the equipment for this plant has already been bought and is being stored in NUCLEP [Nuclebras Heavy Equipment, Inc], in Rio de Janeiro; the respective computer is already on its way to Brazil, unless we want to suspend the shipment and pay for storing it in Germany. To stop now would cause greater damage than to continue...

Now, we all know that this is not the truth. Brazil bought 40 percent of the equipment earmarked for Angra III, which was delivered immediately by the German

suppliers simply because it was already practically ready, standing idle due to cancellation of nuclear power plants planned for that country. But this, after all, does not mean so much if we recall that to build this additional plant we will spend at least $3 billion--an optimistic estimate. It is argued that conclusion of the work that has begun would cost the country no more than $1 billion, which is not true, if only because financing costs must be added.

Moreover, Nuclebras has not yet signed a contract for constructing Angra III. It has committed itself with the contracting firm--very interested in defending the idea that it is cheaper to go ahead than to stop...--only in regard to land preparation. Only this. There is thus no future penalty for contract violations that could make it more expensive to quit, as occurs in other projects.

Lastly, we insist that it is not true that it would be possible to conclude Angra III with $1 billion. It would cost at least $2 billion more than that, if not more! And, as if arguments showing the advisability of postponing it indefinitely were not enough, there is this decisive point: there isn't enough money to carry out ELETROBRAS' most urgent projects, the indispensable minimum to meet growing demand and also to strengthen the transmission and distribution systems. We may even have some difficult times unless there is a perfect and rational application of the already limited funds. How is it possible to begin simultaneously construction of two--note: two, not one!--nuclear power plants whose price represents at least twice that of any hydroelectric plant, and this in a country that still has an immense potential to tap?

Nothing, absolutely nothing--except injured vanity or jeopardized interests--justifies the idea that is now being raised to the effect that it is more economical to build Angra III than to quit. This is the position of contractors and bureaucrats. In fact, it is indeed symptomatic that this idea appeared in the press after Mr Aureliano Chaves visited the construction sites of the nuclear program (including the aberrant NUCLEP, a nearly idle plant for building atomic reactors!) and had conversed with the father of the FRG agreement, Gen Ernesto Geisel. He left there contradicting what he had said before, especially when he was chairman of the National Energy Commission: after all, Brazil needs nuclear energy! Only he did not say when, at what cost and for what.

The mines and energy minister knows that the president of the republic decided on creation of a high-level commission, with representatives of all sectors, including independent members of the government, to render an opinion about the nuclear program and the agreement with West Germany. He must therefore take steps for this commission to be set up and to be given free access to all documents, many of them still secret. Meanwhile, everything remains as it is--that is, the most that will be done is to finish Angra II. And that is already too much for a country that still has 200 million kilowatts in its rivers waiting to be tapped.

Mr Aureliano Chaves should really be thinking about an arrangement to replace any equipment purchased in Germany with other equipment of greater use at this time. Or else freeze everything, as Brazil cannot spend $2 billion just to justify unwise purchases in the past.

8834
CSO: 5100/2154

AMENDMENT BANNING PRODUCTION OF WEAPONS TO BE PROPOSED

Sao Paulo FOLHA DE SAO PAULO in Portuguese 17 Jun 85 p 4

[Text] Brasilia--Impressed by the support he received for proposed constitutional amendment declaring that Brazil will not build an atomic bomb, Deputy Helio Duque (Brazilian Democratic Movement Party--Parana) announced yesterday that he will be in a position to present the proposal for legislative consideration at the end of next week.

"It is a tribute to the Brazilian Armed Forces," he emphasized, "which have always declared themselves to be peace-loving and supporters of peaceful coexistence with our neighbors as well as a tribute to the Brazilian Government, whose anti-war intentions reflect the sentiment of our people."

The constitutional amendment bill already has more than 200 deputies' signatures, which would be enough to guarantee its consideration, which requires only the support of one-third of the members of the Senate (23 senators.)

Military Reaction

Helio Duque was with President Jose Sarney the day before yesterday and, according to him, before going into his office he was called discreetly by an officer interested in the bill and in exchanging ideas on the subject.

The proposal consists in adding another paragraph to Article 7 of the constitution which presently has a single paragraph stating that Brazil will not engage in a war of conquest. The Parana deputy believes it is a matter of adding that Brazil will not build nuclear devices for military purposes, nor purchase or permit the transit of atomic weapons through its territory.

The deputy points out also that the Brazilian Government is a signatory of the Tlatelolco Agreement on the denuclearization of Latin America, which reflects the measure of its peaceful purposes with regard to the utilization of atomic resources.

8711
CSO: 5100/2131

BRIEFS

NUCLEAR AGREEMENT REEXAMINATION--Mines and Energy Minister Aureliano Chaves yesterday announced that the Brazilian nuclear program and the construction of more than five nuclear plants, established in an agreement with the FRG, will be reviewed by a high-level commission made up of representatives of the government and the Brazilian scientific community. After meeting with President Jose Sarney at Planalto Palace, Aureliano Chaves reported that the nuclear program will be reexamined in view of the country's economic situation. The commission, to be established in the next few days, will be coordinated by the Mines and Energy Ministry and will have 120 days to make the study. According to the mines and energy minister, one point has already been decided: The investment in the nuclear program will be reduced but the Angra II and III nuclear plants must be concluded. [Text] [Rio de Janeiro O GLOBO in Portuguese 12 Jul 85 p 17 PY]

NUCLEAR PROGRAM REASSESSMENT--Mines and Energy Minister Aureliano Chaves has proposed to President Sarney that he form a commission to reassess the nuclear program within 120 days. Chaves advocates a slowdown in the work on the projects, while the Secretariat of Planning advocates a total halt. [Excerpt] [Sao Paulo Radio Bandeirantes Network in Portuguese 1000 GMT 24 Jul 85 PY]

JAPANESE-BRAZILIAN AGREEMENT--A scientific and technological cooperation agreement was ratified on 21 June between Brazil and Japan. The agreement entails training in the fields of computer science, microelectronics, nuclear energy, biotechnology in food processing area, health, energy, and technology. [Summary] [Sao Paulo O ESTADO DE SAO PAULO in Portuguese 22 Jun 85 p 13]

NUCLEAR PROGRAM COMMISSION--Mines and Energy Minister Aureliano Chaves would like to institute a high-level commission with the participation of the scientific community, which will propose changes in the nuclear program. [Text] [Sao Paulo Radio Bandeirantes Network in Portuguese 1000 GMT 12 Jul 85]

CSO: 5100/2142

CHILE

BRIEFS

'NO PLANS FOR ATOMIC BOMBS'--Santiago, 17 Jul (AFP)--National Energy Commission President Herman Brady today stated in Santiago that Chile has no plans to build atomic bombs. The country has not even begun research in the military use of nuclear energy, and it does not have any plans to do so in the future, stated Brady, whose post is ministerial level in the government. According to Brady, Chile seriously believes in the Tlatelolco Treaty, which bans the proliferation of nuclear weapons in Latin America. The Chilean support of that treaty is a political decision that will be maintained, Brady added. [Text] [Paris AFP in Spanish 2123 GMT 17 Jul 85 PY]

CSO: 5100/2145

EGYPT

BRIEFS

URANIUM, THORIUM IN AL-BUHAYRAH--Cairo, 4 Aug (MENA)--Egyptian experts working at the Nuclear Materials Organization have discovered uranium and thorium at (Abu Khashyah) village, one of the Markaz Rashid villages in Al-Buhayrah Governorate. The experts emphasize that these two substances exist in large enough quantities to allow economic extraction from black sands that cover a 6 by 2 kilometer area. Dr 'Ali al-Sukkari, chairman of the Soil Chemistry Department of the Nuclear Materials Organization told the Egyptian paper AL-MASA' that an Australian company has been entrusted with extracting nuclear matter from the black sand and will begin producing uranium in this region. The first phase of extraction, he said, will cost about 5 million pounds. This will involve building two factories. The first factory is to produce monazite, a substance used to extract uranium. The second is to produce zirconium, from which thorium is extracted. Al-Sukkari added that the organization will continue to explore for these substances in the area extending from west of Alexandria to Rafah in the northern Sinai. [Text] [Cairo MENA in Arabic 1525 GMT 4 Aug 85]

CSO: 5100/4611

DECISION ON NONPROLIFERATION PACT EXPLAINED TO IAEA

Bombay THE TIMES OF INDIA in English 14 Jun 85 p 16

[Text]

VIENNA, June 13 (PTI).

INDIA has told the International atomic Energy Agency (IAEA) that it opted to remain away from the nuclear-non-proliferation treaty when it became clear that the treaty was going to be discriminatory and ineffective.

The background of the decision was given to the agency's board of governors' meeting here by Indian governor on the board, ambassador, Mr. S. K. Singh, in the course of a 30-minute review of the agency's annual report, which summed up India's "overall thinking" on all issues concerning the agency.

Mr. Singh told the board that in recent months India had been subjected to fresh appeals by "some friends" that it should "accede to the non-proliferation treaty."

He said that when the non-proliferation treaty was being negotiated, India had proposed the inclusion into the text of an article providing for complete stoppage, by nuclear weapon states of their production of nuclear weapons and a cut-off in the production of fissionable materials for weapons purposes.

"If only this request of ours had been heeded then international safeguards could perhaps have been extended to all nuclear facilities in nuclear and non-nuclear weapon states', he said.

Mr. Singh further contended that nuclear weapons states were not even prepared to discuss the matter then. It was clear to the rest of the world then that the treaty was going to be both discriminatory and ineffective.

Since then, he added, nuclear arsenals had risen dangerously. Thus if the matter were to be considered today it would be necessary to reduce 'their arsenals significantly'.

EXCLUDED MATERIAL

Reviewing the ineffectiveness of the treaty, Mr. Singh said that although it claimed a large number of signatories, in practical effect 15 years after the treaty came into force, only 32 per cent of all nuclear power reactors, representing a similar share of nuclear power generating capacity, were covered by the non-proliferation treaty safeguards. This did not include "the vast quantities of nuclear material in facilities dedicated to the production of nuclear weapons in nuclear weapons states", he said.

Turning to IAEA membership, Mr. Singh said 35 out of the total 112 member states could be considered industrially and economically developed. But only 14 of these had significant nuclear activities. And only 18 had shown political will for engaging themselves in significant nuclear work. Eighteen others had desired to pursue the benefits of nuclear science for future generations. Just 12 countries had given high priority for exploiting the potentials of nuclear science and technology.

Mr. Singh said India's attitude to the NPT was based on the country's philosophy to the question of disarmament. It was neither a by-product of any ambition nor a response to any power far away or near to India.

He added these were the reasons why India did not agree to participate in the review of the treaty, which it chose to keep away from.

CSO: 5150/0036

COMMENTARY VIEWS PAKISTAN'S NUCLEAR PROGRAM, INTENTIONS

BK191359 Delhi THE HINDUSTAN TIMES in English 15 Jul 85 p 8

[Editorial: "The Pak Bomb"]

[Text] The report by an American television correspondent that Pakistan has successfully tested in non-nuclear explosions U.S.-made Krypton electronic triggers used to set off nuclear bombs need not provoke a panicky Indian reaction since Prime Minister Rajiv Gandhi has stated on more than one occasion that New Delhi is fully alive to Islamabad's nuclear developments as also its dubious intentions. Nevertheless, the report attributed to U.S. intelligence sources, but neither confirmed nor denied by the U.S. Government, is of a piece with the formidable weight of the evidence earlier adduced by such informed persons as U.S. Senator Cranston and the U.S. Nuclear Control Institute that "the Pakistanis have been all over using legal and illegal means to get whatever they need to augment their nuclear weapons program."

That Pakistan has been using fair means and foul to smuggle out of the U.S. and other advanced European countries vital electronic components needed to achieve its nuclear ambitions was brought home not long ago when several Pakistanis in private capacity unsuccessfully tried surreptitiously to take out of these countries sophisticated devices in bits and pieces that could only be used to trigger an atomic explosion. If Islamabad has indeed succeeded in hood-winking U.S. security agencies to get what it was desperately looking for, it should be enough to cause alarm in Washington. But considering the manner in which the Reagan Administration has acted in the recent past to pamper the Zia regime, it looks as though nothing short of a full nuclear test by Pakistani scientists will make U.S. policy-makers realise the gravity of the situation. If Washington still doubts Pakistani duplicity in the matter of its nuclear intentions, it must surely be living in a fool's paradise.

The Pakistani 'Islamic' bomb poses a real danger not to the U.S. but to India, and it is our policy makers who should spell out appropriate counter-measures to meet the Pakistani threat. Merely hedging the issue or saying thatIndia will react only after the Pakistani fait accompli has been proved may be too late to counter Zia's blackmail. When an Israeli general, who had earlier headed the Mosad intelligence outfit, was asked by an Indian correspondent some years ago what his country would do in the event of Pakistan acquiring a nuclear bomb and whether it was contemplating any pre-emptive attack on

Pakistani nuclear installations like the one it staged on Iraqi nuclear complex, the general reportedly countered the correspondent thus: "The Pakistani nuclear bomb is your headache. How you go about it is your business. Why drag in Israel to do your dirty work?" Rajiv Gandhi may be right when he says that India does not want to have nuclear weapons, but what other options does he have to prevent Pakistan from using nuclear blackmail in the foreseeable future?

CSO: 5100/4767

COMMENTATOR WRITES ON PAKISTAN NUCLEAR CAPABILITY

New Delhi PATRIOT in English 20 Jun 85 p 4

[Article by R.R. Subramanian]

[Text]

Today, one sees officials of the Pakistani Foreign Ministry admitting that its programme at Kahuta is capable of producing enriched uranium only upto five per cent. Any nuclear enrichment facility that can increase the content of the fissile uranium 235 from 0.7 per cent to five per cent, can in theory also jack it up to 90 per cent.

It is exactly six years since Pakistan's pursuit of nuclear enrichment technology was made public. At that time Islamabad refused to acknowledge the existence of such a programme and went so far as to say that all revelations about it in the Western media were part of motivated Zionist propaganda.

Today, one sees officials of the Pakistani Foreign Ministry admitting that its programme at Kahuta is capable of producing uranium enriched only up to five per cent. This admission is in itself interesting in that any nuclear enrichment facility that can increase the content of the fissile uranium 235 from 0.7 per cent (occurring naturally) to five per cent, can in theory also jack it up to 90 per cent—the purity that is required for a weapons grade critical assembly.

The centrifuge technology is based on the European consortium URENCO's design. The brilliant metallurgist Dr Abdul Qadir Khan has successfully adapted this technology at Kahuta. This allows for the fact that all the 3000 centrifuges need not be loaded at the same time. As and when they are ready they can be added on to the rotating assembly.

According to a report prepared by the US Congress Office of Technology Assessment in 1978, once reactor grade uranium (three per cent) is available, the URENCO design requires merely 400 centrifuges to produce weapons grade uranium.

One must then assume that Dr Qadir Khan's claim in February 1984 that "given the green signal he could produce an atomic bomb", was not an idle boast. The Dutch Parliament's enquiry into the A. Q. Khan affair in 1981 had revealed that 6200 martensitic age hardened steel tubes had been purchased by Pakistan through several dummy companies in Europe. At that time it appeared as if A Q Khan was emulating his counterpart Ampie Roux of South Africa and working on the novel "vortex tube" technique. Events since then have proved that conjecture wrong. Khan has chosen to merely spin his centrifuges at twice the speed of sound and not put them into a "vortex" motion.

In December last year, U S officials based in Washington had warned President Zia-ul Haq that his programme of enrichment, might jeopardise the 3.2 billion dollar military and economic aid started in 1981. This warning was actually conveyed in a letter from President Reagan to Gen. Zia in September 1984. Though the contents of the letter were not revealed, the Pakistani newspaper Nawai-e-Waqt claimed at that time that President Reagan was offering a nuclear umbrella to Pakistan. It turned out later, that what the letter did was to warn Zia not to process uranium at the "unsafeguarded" Kahuta plant beyond the five per cent enrichment. The Financial Times of London on 6 December last quoted a US official describing the Reagan warning as a new "marker" which Pakistan must respect. Other "markers" communicated to Pakistan included not to test a bomb, not to assemble a bomb, and not to ask another country to test a device on Pakistan's behalf (a clear reference to China).

This allowance of five per cent by Washington is spurious. If, as the Pakistan leaders claim, the Kahuta programme is purely for peaceful purposes, then why not three per cent (the enrichment grade that is usually necessary for the operation of nuclear reactors)?

It appears as if the Reagan Administration, in order to please both the non-proliferation lobby in the US Congress and the military leadership in Islamabad, chose the benchmark as a sort of compromise formula. Washington, having lobbied in the Senate in 1981 to waive the provisions of the Symington Amendment of 1976 to the Foreign Assistance Act (which explicitly forbids American military aid to countries that are embarking on a nuclear weapons capability through enrichment) to accommodate Pakistan, on the bogey of Soviet intervention in Afghanistan, now finds itself in an embarrassing position.

However, what the United States has chosen to forget is that Pakistan need not test the uranium bomb. In 1945, American scientists had not tested the Hiroshima bomb, because they had reasonable confidence that the bomb derived from enriched uranium would go off. This is not to suggest that all countries that have built enriched uranium bombs have not tested their bombs. Rather, the opposite is true. What is being suggested is that Pakistan can reasonably "cover all its bets" and maintain its ambiguity.

For the first time, the Ministry of Defence in its Annual Report this year has drawn attention to Pakistan's nuclear developments. And Defence Minister P V Narasimha Rao recently said that Government would like to elicit the views of Parliament on the options that are available to India.

In view of Pakistan having reached the five per cent benchmark, with the acquiescence of the United States, several possibilities arise. To name a few:

a) Pakistan continues to upgrade Kahuta; or
b) Pakistan stockpiles enriched uranium and does not detonate; or
c) Pakistan detonates in 1986 (after all the 3.2 billion dollar aid has come) and then claims it is a peaceful nuclear explosion.

New Delhi is seized of the gravity of the situation, but there is a need of public debates on the pros and cons of the various "options" before the country to help leaders to take the right decisions.

CSO: 5150/0034

INDIA

URANIUM RESERVES ESTABLISHED AT 73,000 TONS

Calcutta THE TELEGRAPH in English 8 Jul 85 p 5

[Text] Hyderabad, July 7--The atomic minerals division (AMD) has established 73,000 tonnes of uranium reserves that may be exploited for commercial use. These reserves will be "more than enough" to support the 10,000-MWe nuclear power programme envisaged for the Seventh Plan period, according to Dr T. Mahadevan, director of the atomic minerals division.

Recent exploration indicates new potential for uranium in the Sivaliks belt, Sikkim, Arunachal Pradesh, Meghalaya, Madhya Prades, the Western Ghats region in Karnataka, West Bengal, and Badam Pahar and Gopalpur beach in Orissa, besides the established areas like the Singhbhum belt in Bihar.

Of the 73,000 tonnes identified, around 40 percent of the sites have been handed over to the Uranium Corporation of India (UCIL) for commercial exploitation. Mr N. Scrinivasan, chairman of the nuclear fuel complex, said "The scope of the nuclear power programme will depend on what they will be able to unearth. It is due to their confidence that we have confidently embarked on our ambitious power programme."

In an effort to extract the maximum possible uranium from the ore, the atomic mineral division has ventured into the field of bio-technology. The use of the bacteria, thio bacillus ferroxidians, helps in reducing the use of reagent consumption and reaction time. The use of biotechnology also enables treatment of low grade ore to extract better quantities of uranium. A pilot plant with the use of bio-technology has been initiated in the Uranium Corporation plant at Jaduguda, but this "bacterial leching" as it is also called, is still in the development stages.

The AMD has been allotted a budgetary grant of Rs 10 crores of which Rs 8 crores will go into revenue application and Rs 2 crores for capital purposes.

The AMD is now also going in for surveys through infra red imagery.

CSO: 5150/0038

EXPANSION UNDERWAY AT NUCLEAR FUEL COMPLEX

Madras THE HINDU in English 6 Jul 85 p 7

[Text]

HYDERABAD, July 5.

The Nuclear Fuel Complex (NFC) here has embarked on a Rs. 27-crore expansion programme to meet the requirements of the nuclear power plants by the turn of the century. Nuclear power plants are slated to generate 10,000 MW by 2,000 A.D., about 10 per cent of the total power generation capacity and thus NFC assumes a vital role.

Dr. N. Srinivasan, Chairman, Board of Directors of the NFC, and Dr. K. Balaramamoorthy, Chief Executive at the fuel complex, told a party of visiting newsmen from Hyderabad and New Delhi that production of uranium fuel would go up from the existing 90 tonnes to 180 tonnes during 1986-87 and that of zircaloy (finished component) from 35 tonnes to 50 tonnes. The expansion project was under way, with Rs. 7 crores spent on it. It was also planned to revamp and augment the capacity of the existing atomic power plants which had completed 12 years of operation.

First in world: Safety and self-reliance, in that order, are the watchwords at the NFC, which has put India in the exclusive club of about a dozen self-reliant countries in the vital field of nuclear fuel fabrication. Dr. Balaramamoorthy said the NFC was the first in the world to have all production facilities for both uranium and zirconium, starting from the concentrated ore to the finished ready-to-use fuel assemblies and other components.

Crude concentrates of magnesium di uranate, raw material for natural uranium oxide production, is supplied by the Uranium Corporation of India Limited (UCIL) at Jaduguda in Bihar. The yellow cake is processed and the uranium oxide powder is compacted into cylindrical pellets and sintered at 1700 degree centigrade in hydrogen atmosphere and loaded into zircaloy fuel tubes. The uranium oxide fuel bundles thus produced at the NFC are supplied to the atomic power stations. So far 37,000 fuel bundles, valued at Rs. 92 crores, have been produced here. The reactor performance of the fuel bundles produced at the NFC have been consistently good, with a defect rate of only 0.1 per cent against 0.28 per cent encountered on the fuel bundles imported for the Rajasthan Atomic Power Station (RAPS-1).

Improvements in fuel design: Dr. Srinivasan said continuous improvements in fuel design were being made to reduce costs. The bundles fabricated for RAPS and MAPP (Madras Atomic Power Project) had 19 elements while those for the Narora Atomic Power Project (NAPP) would be 22 elements. Production of the 22 element bundles had started. Zircaloy mill products and reactor core structural components like pressure tubes, calandria tubes, were manufactured in the three chemical and metallurgical plants and these were fabricated to stringent specifications right from the raw material, zircon sand, obtained from the Indian Rare Earths Limited (IREL). The NFC had fabricated and supplied incore structural components of zircaloy for MAPP-1 and 2 and NAPP-1.

For seven years, the NFC had been manufacturing and supplying seamless stainless tubes and seamless ball bearing tubes for nuclear power stations. The tube plant had capacity to make 2000 tonnes of seamless stainless tubes of varying sizes and 21,000 tonnes of seamless ball bearing tubes. The seamless stainless tubes were used extensively in power generation, fertilizer and chemical industries because of their corrosion resistance and mechanical strength at higher temperatures.

The NFC's special materials plant produced pure magnesium granules and other materials up to 99.999 per cent purity such as selenium, zirconium powder, indium and tantalum products.

Stringent safety rules: Dr. Srinivasan said safety rules in the DAE establishments were tighter than those in other countries and were becoming more stringent each year. In short, the safety chief could close down a plant without any questions being asked.

Environmental and employees' safety had assumed importance in recent weeks with the alleged discovery of thorium oxide in a water cooler at the NFC and detection of a radioactive substance at the Electronic Corporation of India Limited (ECIL) which is close by.

NFC officials explained at length that exposure to radiation, seepage of nitrates into groundwater, airborne uranium were well-below permissible levels and every effort was made to ensure the safety of the employees and protect the environment.

They said airborne uranium levels were well below permissible levels of air activity both for natural and enriched uranium plants. Airborne chlorine levels in the zirconium sponge plant were also well below permissible level.

Wells found safe: The health physics unit examined water samples in 100 wells within a 20-km range and found that nitrate levels were below permissible level, though things were not satisfactory some years ago.

On radiation exposure, NFC official said the maximum dose ever recorded was 510 millirem while the permissible level was 5,000 millirem.

Solid wastes were put in sealed drums and kept underground. These were periodically removed, repacked and buried. The procedure was much in accordance with international standards and there was, therefore, no leak of radioactive substance.

CSO: 5150/0037

INDIA

BRIEFS

INDO-CUBAN NUCLEAR ENERGY PACT--Havana, May 30--India and Cuba have reached an agreement on the peaceful use of nuclear energy, the first such understanding between the two countries, reports Tanjug. The agreement provides for cooperation in the use of nuclear energy in medicine, de-radiation of foodstuffs, physics and other domains and will provide the base for broader cooperation in the field. The agreement was signed here by the chairman of India's Nuclear Energy Commission, Dr Raja Ramanna, and the Executive Secretary of the Cuba Nuclear Energy Commission, Mr Fidel Castro, the son of President Castro. [Text] [Calcutta THE STATESMAN in English 31 May 85 p 13]

CSO: 5150/0033

COMMENTARY VIEWS U.S.-CHINA ACCORD

Karachi MASHRIQ in Urdu 27 Jul 85 p 3

[Editorial: "A Generous Attitude Should Be Adopted With Pakistan as Well"]

[Text]

At last a nuclear accord has been signed between the United States and the PRC, which will forge closer ties between the two nations. Mr Li Xiannian is the first PRC president to visit the United States. This historic visit has culminated in the signing of an accord.

Although President Reagan had assured the PRC of nuclear reactors when he visited Beijing 14 months ago, an agreement was not signed. The delay was due to the anxiety of some members of Congress about some sources' secret information that Pakistan was making a nuclear bomb with the PRC's assistance. Pakistan and the PRC vehemently denied this fallacious allegation, but despite this, the negative propaganda delayed the settling of dust over this issue. Now after 14 months, the U.S. Administration is convinced that there was no past collaboration between Pakistan and the PRC in the nuclear field, and nor will it transfer any of its technology to Pakistan or any other country in the future. In order to meet the needs of its rapid progress, the PRC requires at least 10 nuclear power plants by the end of this century, the cost of which would be about $20 billion. If the United States had not signed this agreement with the PRC, then the PRC would have approached the European countries.

In any case, the United States has acknowledged that the PRC is going to use nuclear energy for peaceful purposes and that it requires 10 plants. The same problem faces Pakistan. In order to control its energy crisis, it need nuclear energy plants; but not only is the United States reluctant to provide the same to Pakistan, it is also exerting pressure on other countries manufacturing nuclear equipment not to give Pakistan the reactors it needs. This is the most unjust form of discrimination against Pakistan.

Now when the United States has signed a nuclear accord with the PRC, showing complete confidence in its program, and when it is supplying military and economic aid to Pakistan with the same confidence in its peaceful nuclear program, then it is about time it ended its opposition to the need for equipment for its nuclear power plants. There is no reason for discriminatory treatment against Pakistan. Pakistan has even offered to sign a nonproliferation agreement with India if the latter agrees to do so. If India does not agree, the United States should put pressure on India rather than on Pakistan.

CSO: 5100/4770

SOUTH AFRICA

AEC HEAD ON OPERATION OF NUCLEAR INDUSTRY

Johannesburg BUSINESS DAY in English 12 Jul 85 p 4

[Report of interview with Dr Wynand de Villiers by Berenice Margolis]

[Text] As executive chairman of the Atomic Energy Corporation, Dr Wynand de Villiers has the awesome task of overseeing the recent reorganisation in the administration of SA's nuclear industry. Berenice Margolis spoke to him.

GOING TO bed at night is a far more hazardous occupation than working at Koeberg — more people die in their beds than anywhere else. This from Dr Wynand de Villiers, executive chairman of a restructured Atomic Energy Corporation (AEC).

Although given to *grappies*, he's not joking. "The risk accepted by the AEC, in an accident situation — to people living on the perimeter of Koeberg, and they're the most exposed — is one in one hundred million. The safety of those living in the environment of that plant is our only criterion."

He's adamant that when Escom closed down Koeberg amid the glare of publicity and adverse comments it was not a panic reaction. There were no certainties, he says, although after rigorous testing just four stainless steel pipe fittings had to be replaced.

"In the Western world, in the 30 years since the inception of the civilian nuclear industry, no one has died as a direct result of an accidental radiation overdose at a nuclear power station.

"When you get Class F meteorological conditions — with slow winds — in a 'worst case' accident, radioactivity will remain concentrated in a radioactive cloud which could eventually reach densely-populated areas. It's been stated that, even though the AEC disagrees, in such a 'worst case' about 6 000 people might be over-exposed and die within the next 30 years."

In context, Three Mile Island is an obvious (if odious) comparison. In that instance it was calculated only one more person in Harrisburg than the 200 000 who would naturally die of cancer there might also subsequently develop the disease. He restates his original thesis, serious now. More people die annually by going to bed, through road accidents — or from smoking. He lights another cigarette.

Business Day spoke to De Villiers in his bland office on the ninth floor of 228 Visagie Street, a street surely Pretoria's drab equivalent of Whitehall — Armscor, the Land Bank and other parastatals present their dull facades here.

However, De Villiers, 55, not the quintessential civil servant, enjoys his job. He concedes that had he the potential of a brilliant research physicist he'd be one. "But someone has to cope with the drudgery of management." He grimaces faintly. "The satisfaction comes from getting the work done and understanding enough about it to ensure it's well done. Also in helping to take worries off guys' shoulders."

He's been involved in the streamlining exercise of the previous "troika arrangement" that included the AEC, the Uranium Enrichment Corporation (Ucor) at Valindaba and the Nuclear Development Corporation (Nucor) since 1982. That year nuclear licencing was handed over to the AEC from the former Atomic Energy Board (AEB).

"We'd been looking at further rationalisation since 1980, when the late Dr Ampie Roux was asked by government to head a committee to investigate reorganisation of State-funded nuclear activities. The government accepted its proposals in principle and the present change is a result of the process started in 1982."

Because of unnecessary duplication, Ucor and Nucor have been taken over by the AEC, vesting central control in it. There might be staff cut-backs, De Villiers admits, but these will be achieved by natural attrition over two years. Vacancies that crop up will not be filled. Frequent staff movement between various sections means employee re-allocation, where feasible, will be eased in the new set-up. "There'll be no immediate shocks."

With rationalisation, the separate identities of AEC's three sectors will come to an end. Ucor will become a fully-fledged industry supplying enough enriched uranium to meet SA's needs in about two years and will be known as AEC's Nuclear Fuels Section. Nucor will continue with research and development and will be designated the Research and Development arm of the AEC. Corporate Services will take in all crucial needs of the various nuclear activities.

It's while talking to a sensible and cheerful executive ("I'm not always available but the door's always open") that the insanity of SA's exclusion from certain United Nations bodies — whatever the colour of your politics — hits you between the eyes.

Take the International Atomic Energy Agency (IAEA). Originally set up to promote nuclear energy in all its forms, it's been authorised by all member countries to administer safeguards. It employs about 150 inspectors.

Most suppliers stipulate IAEA precautions to ascertain exclusively peaceful use by the recipient country. Two or three inspectors have access to Koeberg and Safari several times a year. In a word, relations between the IAEA and SA are "strained".

Yet SA is one of seven founder-members and had always been on the Board of Governors. "Until, in 1978, the group of 77 non-aligned nations voted us off the board. In 1979, in New Delhi, when I led the SA delegation to the general conference there, our credentials were improperly rejected — an illegal move. While some participants didn't even present theirs."

De Villiers passes up a question on a home-grown atomic deterrent. "The government has flatly denied that we have it." He allows that SA has the ability to enrich uranium to 40% and, therefore, commensurate technology to enrich it further. The cost, however, would be prohibitive. "The 40% is used to fuel our research reactor, Safari 1, at Pelindaba.

Born in Smithfield in the Free State, he got his BSc in 1949 and MSc (*cum laude*) in 1951, and in 1957 earned his doctorate in physics — all at the University of Stellenbosch. He also serves on several public and semi-public bodies and is chairman of the Scientific Advisory Council.

De Villiers demurs that his job is a weighty one. "I get a bit frustrated, but that's because of external factors. Outside work I'm interested in too many things — carpentry, electronics. I fix my own cars and work around the house". He plays tennis and, under pressure, "I even play the piano".

He's married with four children, the youngest 26. "I won't tell you the age of the eldest as she's female. I'm a very quick reader — of anything — novels, whodunnits, you name it. I finish a book in an evening when I have the time and I never take work home if I can help it."

CSO: 5100/36

SUDAN

BRIEFS

NUCLEAR WASTE DUMPING BAN URGED--Khartoum, 8 Jul (SUNA)--The Transitional Military Council's [TMC's] political committee met with the committee that opposes the dumping of nuclear waste in Sudan this morning. The committee submitted urgent demands to the TMC on making public documents and information on the dumping of nuclear waste in Sudan in order to eliminate any ambiguities on this issue and to try anyone whom these documents prove to have been involved in this crime. The demands also include ratification of the antinuclear tests agreement, bolstering of voluntary popular activities that are hostile to such tests in the country, mobilization of the media to enlighten citizens about the dangers, and protection of the environment from pollution. [Excerpt] [Khartoum SUNA in Arabic 1715 GMT 8 Jul 85 JN]

CSO: 5100/4609

BRIEFS

NUCLEAR SAFETY CONSULTANTS WITH SPAIN--Moscow July 15 TASS--A delegation from Spain's Nuclear Safety Council, headed by the council president, Francisco Pascual Martinez, stayed in the Soviet Union from July 6 to 14. During consultations at the State Committee of the USSR on the use of atomic energy, the sides discussed the Soviet and Spanish competent bodies' attitude to nuclear safety measures at atomic power plants in both countries. The sides noted the usefulness of the talks and advisability of further cooperation. The Spanish delegation was received by Chairman of the State Committee of the USSR on the use of Atomic Energy Andranik Petrosyants, Chairman of the State Committee of the USSR on Control over Safety of Work in Atomic Power Engineering Yevgeniy Kulov and First Deputy Chairman of the Health Minister of the USSR Yevgeniy Vorobyev. During their stay, the Spanish delegation visited the Novovornezh Atomic Power Plant named after the 50th anniversary of the USSR and the I.V. Kurchatov Atomic Energy Institute. [Text] [Moscow TASS in English 1602 GMT 15 Jul 85 LD]

CSO: 1807/392

EURATOM TO TIGHTEN URANIAN SALES TO ISRAEL

AU121033 Rome ANSA in English 0855 GMT 12 Jul 85

[Text] (ANSA) Brussels, Jul 12 -- The European Community's atomic watchdog organization, Euratom, has decided to tighten checks on sales of uranium from EC member states to Israel. The ruling stemmed from the discovery of a recent sale to Israel of 47 tons of uranium waste material by a Luxembourg company, which purchased the enrichment process fallout from French and British plants. The sellers reported the sales to Euratom, the EC's atomic energy commission, but the buyer did not. When Euraton inspectors went to Luxembourg to look for the material, they found that it was no longer in the country.

The events were reported to EC governments and the International Atomic Energy Agency, which has its headquarters in Vienna. Subsequent investigations found that the material had wound up in Israel. The Israeli Government agreed to let IAEA make an inspection to show that the uranium had not been utilized and, in any event, was not ticketed for non-peaceful employment. According to experts, 47 tons of uranium waste can be turned into two kilograms of enriched uranium through a very costly transformation process.

[Paris AFP in English at 0928 GMT on 12 July reports: "Last night, the Luxembourg deputy prime minister, Jacques F. Poos, said his country had advised the relevant EEC authorities as well as the International Atomic Energy Agency in Vienna of the reexport of the material to Israel. The agency sent two experts to Israel, and they found that the depleted uranium had in fact been used for experiments in alloy-making in Israel's metallurgical inudstry, said Mr Poos, who is also Luxembourg's foreign minister."]

CSO: 5100/2566

FUTURE OF BREEDER REACTORS IN EUROPE DISCUSSED

Paris AFP SCIENCES in French 20 Jun 85 pp 55-56

[Article: "The Future of Breeder Reactors in Europe"]

[Text] Athens--According to a survey of directors of electricity producers attending their international congress, UNIPEDE [International Union of Electric Power Producers and Distributors], which took place in Athens on 10-14 June, there is a consensus in Europe in favor of building new nuclear breeder reactors, but differences still remain, in particular concerning the calendar.

Thus, West German companies seem to be less in a hurry to start building a new European prototype than their French and even Italian and British partners. Competition between France and the FRG is also emerging as far as selection of the site is concerned.

By the end of the year, production will start at the "Superphenix" breeder reactor built at Creys-Malville (France) by Nersa (France 51 percent, Italy 33 percent, FRG 11 percent, Belgium and the Netherlands 2.4 percent, United Kingdom about 0.2 percent) at a total cost of about FF 21 billion, according to Mr Boris Saitcevsky, president of Nersa.

The breeder reactor is "a tool that appears to be already competitive with coal power plants and far more so with fuel power plants," Mr Marcel Boiteux, EDF [French Electricity Company] chief executive officer, stated; he added that "it is however not competitive with traditional nuclear power plants (whose cost per kWh is now only half as much in France) and is not expected to become competitive before the year 2000."

Breeder reactors, however, offer the advantage of consuming 50 times less nuclear fuel than traditional reactors, which rules out any risk of ore-supply shortages, Mr Boiteux pointed out.

Although reactors of this type will cost more, we should get ready now for the next century, Mr Boiteux estimated. As for Mr Gunther Klatte, member of the managing board of the leading West German electricity producer (RWE [Rhine-Westphalia Electricity Works]), he estimated that "there is no uranium scarcity in sight and there is no reason to rush." "We have 5 or even 10 years to decide what is the best reactor system" for nuclear breeder power plants, he added.

His partners also observed that this is less urgent than was thought only a few years ago. However, "Europe ought not to lose its world leadership in this field, and ought to build a new prototype within 3 to 5 years," Mr Franco Velona, assistant general manager of the Italian Electric Power Agency ENEL, pleaded. If we wait too long, the teams of researchers and technicians that were formed to build Superphenix will disperse and we would regress instead of progressing, Mr Saitcevsky warned.

According to Mr Frederick Bonner, vice-president of the British electricity producer CEGB [expansion unknown], a decision should be made within 2 to 3 years concerning the construction of the next European breeder reactor, which might be followed by 2 more in the next 15-20 years. For his part, Mr Klatte is confident that, when the time comes, a site for the next prototype could be found in the FRG in spite of ecologists' opposition to nuclear power. His French partners, fearing that this problem will delay construction, are already preparing their dossiers so as to be able to submit an "inclusive" dossier by 1987, and they might propose to build the next European breeder reactor next to the first one, at Creys-Malville.

9294
CSO: 5100/2571

EC PROJECTS FOR STORING RADIOACTIVE WASTE

Vienna INDUSTRIE in German 12 Jun 85 pp 23-26

[Article by Rudolf Weber: "The European Community Is Building Radioactive Waste Storage Facilities"]

[Text] Public concern has caused a worldwide speedup in research on disposal of highly radioactive wastes in recent years. The European Community is presently constructing one storage project for demonstration purposes in each of the following countries: Belgium, the FRG and France. National storage facilities, to be operated by industry, could follow in the 1990s.

Final storage, the final disposal of radioactive waste materials generated in the reprocessing of nuclear fuels, has for several years been the hottest topic of discussion on nuclear energy. Opponents of nuclear energy call the fact that no final storage facilities are in existence an "unsolved problem." On the opposite side, the nuclear industry insists that a requirement for final storage will not come about until the next century (the relatively small quantities of waste materials will in the meantime have to cool off for several decades in intermediate storage facilities) and is convinced that by then a solution will certainly have been found.

What waste materials are we talking about, and what do we mean by "safe?" The bone of contention is the highly radioactive wastes and those of medium activity which are also generated by the reprocessing of spent nuclear fuel and which contain alpha emitters with a very long half-life--the former because they radiate warmth for several centuries, and both categories because alpha radiation will not weaken essentially until 100,000 or more years have passed. Safety in final storage thus means the disposal of wastes in a manner which will prevent them from endangering our living space forever. Worldwide plans call for building a final storage facility in the shape of a mine whose adits and entrance shafts would be sealed forever following the introduction of the waste materials.

On behalf of the European Communities, the EC Commission in Brussels undertook the task of coordinating the research projects dealing with this area and to provide one-half the required funding for them. After the results

of the first 5-Year Program 1980 had been presented in Luxembourg, the Second EC Conference on "The Treatment and Final Disposition of Radioactive Wastes" about the results of the second 5-Year Program took place there from 22 to 26 April 1985. Four hundred scientists from 20 countries discussed 50 papers, all of which had been jointly prepared by several researchers from different EC countries and which dealt with three subject areas: conditioning of the waste materials, the stability of the conditioned wastes and final storage itself.

In conditioning (i.e., processing into solid, mostly non-water-soluble units which are impervious to aging), significant progress has been made in reducing waste volume and energy cost--both making final storage cheaper. Current state-of-the-art forms of processing, which are already in industrial use, are the imbedding of medium strength radioactive wastes in concrete, asphalt or plastic, and vitrification of highly radioactive wastes. It was emphasized at the Luxembourg meeting that comprehensive quality control at all steps of conditioning is a prerequisite for attaining the required stability of waste materials.

This stability has been tested in the laboratory as well as in the field for storage conditions in clay, granite or salt. Today we know the mechanisms of leaching and corrosion of the waste materials as well as their coverings (glass solids are covered with titanium, steel or other alloys). Contrary to earlier fears, radiation accelerates leaching only slightly. In general we can state that the stability of the packages can safely be assumed to last several thousands of years, but not the required periods of time. To prevent environmental damage after a potential disintegration of the waste packages, these packages must be enclosed in additional barriers in the storage facility.

Reliable Predictions

There is widespread belief, at least since the 1980 Luxembourg conference, that extensive rock strata which have been stable for millions of years ("geological formations") provide the optimum conditions for safe final storage facilities. However, there were no conclusive answers to these questions: which geological formations and which fill materials are best suited for the purpose? What quantities of radioactive materials could enter the environment in water if the waste packages were to deteriorate? And finally, can the safety of a final storage facility be predicted reliably? These are some of the answers given in 1985 in Luxembourg:

Many experiments, for example in the FRG the experiments of many years' standing for final storage in the former Asse II salt mine and in the abandoned Konrad iron ore mine, permit the conclusion that granite, sediment rock and salt are basically suited for safe final storage. Any country's decision on what type of geological formation to use depends upon its availability and its quality as concerns each individual case:

--a great number of extensive salt domes exist in the FRG and the Netherlands. Heat tests in Asse II have eliminated the last lingering doubts as

to their suitability for storing heat-radiating wastes. Heated rock salt "creeps," thus closing even microscopic fissures through which water might enter.

--underground laboratories for suitability testing have been or are being constructed in a variety of sediment formations, among them the Konrad Mine (iron ore), in Mol, Belgium (clay) and in Pasquasia, Sicily (potash);

--deep drilling and rock laboratories in granite, e.g., in France's Mont Blanc Tunnel, have shown that while such formations always contain water-bearing cracks, the movement of this water is minimal and that this porosity generally decreases with greater depth;

--tests for storage in clay sediments on the ocean floor have been conducted in three locations in the Atlantic, each at a depth of several thousand feet. Holes can be bored from the ship or rocket-type "penetrators" can be dropped which dig themselves 30 or more meters into the ocean floor due to their high sinking velocity.

In addition, the materials used to block the tunnels and shafts of a storage facility are supposed to absorb penetrating water and retain any radioactive materials which may have separated. Since it is required in large quantities, it must also be cheap. Clay, cement, salt and synthetic materials have proven suitable in tests. The question is still unresolved as to whether and how any cavities unavoidably occurring during the filling of shafts can be closed.

Drinking Water Pollution?

Conditioning, construction of the final storage facility, storing and filling of shafts may not constitute simple engineering tasks, but they can be solved. The real problem with safe storage occurs if, in a worst case scenario, the waste packages have disintegrated several thousand years hence and water transports the radioactive materials, with a long half-life, to the surface of the earth, the geosphere, thus polluting the drinking water. We do not yet understand all the details of what would occur in such a "migration" through filling materials and rock formations--which chemical compounds form humic acid in water; to what extent these and other compounds settle in the fill material and the rock formations or what effect micro-organisms have on them. To answer these questions, the EC has initiated Project MIRAGE (Migration of Radionucleides in the Geosphere), which includes field testing in clay, granite and salt in the FRG, in Great Britain, France, Italy, Belgium and Sweden. The objective: a mathematical model of migration which will be usable for safety calculations.

A New Ice Age in Europe

Since final storage facilities cannot be tested for the next 100,000 years and more, their safety must be confirmed indirectly. We know the pattern of radioactive decay and that of leaching and corrosion of the waste packages, and we have a migration model. In addition, we make assumptions about the probable geological future of the storage formation (Europe will undergo

another ice age within the next 100,000 years--a thick sheet of ice would reduce the permeability of granite). All these events are formulated mathematically. With the aid of the computer, this provides data on radiation exposure to be expected at any future point in time.

Several independently conducted preliminary estimates indicate that even in the worst case radiation exposure would be far below the 10 millirem per year which are set as the limit by several countries, among them Switzerland.

The First Step...

To further refine these estimates while at the same time avoiding duplications of effort and errors, the EC coordinates the research activities of the member countries in this area also and provides financial support for them during the 1985-1989 period with a total of about 1.6 billion [Austrian] Schillings. In Project PAGIS (Performance Assessment of Geological Isolation Systems) there is a search for a standardized procedure for safety analysis, in which the mathematical models for migration tests in salt (in Gorleben, FRG), clay (in Mol, Belgium), granite (in Auriat, France) and in Atlantic ocean floor sediment are tested for the realism of their simulations.

...Has Already Been Taken

Even though there are still gaps in knowledge, especially in the matter of migration, sufficient experience has been accumulated to permit starting construction of prototype storage facilities. They are being built under EC auspices in Asse II (for salt), Mol (for clay) and a location in France yet to be determined (for granite). These test storage facilities for medium and highly radioactive wastes should serve to fill in the gaps in knowledge, permitting industrial storage facility construction in the early 1990s. The cost of such a facility which would accept all the medium and highly radioactive wastes of 25 nuclear power plants in the 1,000 megawatt class, including transport and filling of shafts and tunnels, is estimated at about 30 billion [Austrian] Schillings, which would amount to a cost of less than .007 Schillings per kW hour.

[Photo Captions]

[p 23] Interior of the rock laboratory of the Swiss "National Society for the Disposal of Radioactive Wastes" (NAGRA) on the Grimsel Pass: Heated mockups simulate highly radioactive vitrified wastes, to determine possible fissure formation in the granite.

[p 25] Tests for final storage in the Atlantic: rocket-type "penetrators" impact the sediment layers on the ocean floor at approximately 200 km/hour and penetrate 30 meters or more.

[p 26] Final storage tests in the closed FRG Asse II salt mine: vitrified "hot" wastes are simulated on the floor of a cavern chipped out of the rock formation. Asse II is intended to be one of the three EC prototype final storage facilities.

9273
CSO: 5100/2564

BRIEFS

RESOLUTION ON NUCLEAR ENERGY--The 20th International Congress of the International Union of Electric Power Producers and Distributors (UNIPEDE) came to a close on 14 June in Athens after adopting, among others, a resolution calling for the development of nuclear energy. "The public's concern in this respect is excessive in some countries," as nuclear power plants have shown that they were "safe and non-polluting," one of the final resolutions adopted by the delegates of electricity producers and distributors in 32 member countries, including 22 European countries, pointed out. "Nuclear energy must represent an increasing proportion of European electricity production, both because of its lower cost and because it makes it possible to reduce dependence on imported oil and coal, the UNIPEDE also stated. In another resolution, UNIPEDE members drew the attention of their supervising authorities on the need for "electricity prices to cover all of the supply costs, and for electricity not to be subjected to more severe taxation or control than other forms of energy." [Text] [Paris AFP SCIENCES in French 20 Jun 85 p 56] 9294

CSO: 5100/2571

FRANCE

NUCLEAR PLANT OPERATION REPORT FOR MAY 1985

Paris AFP SCIENCES in French 13 Jun 85 p 56

[Article: "Operation of Pressurized-Water Reactor Nuclear Power Plants in May 1985"]

[Text] Paris--The overall availability of nuclear power plants using REP 900-MW pressurized-water reactors was 74.7 percent in May 1985 and 80.2 percent for the 12-month period ending on 31 May 1985.

The rate of utilization of these power plants during their availability was 84.8 percent in May 1985 and 91.9 percent over the last 12 months.

Accidental downtimes (equipment failures) represented 3 percent of the total energy production capacity of the REP 900-MW reactors in May 1984.

Paluel 1	Shut down from 15 to 22 May, for work on valves and fittings (primary and secondary circuits)
Paluel 2	Operating at about 80 percent of maximum possible power (turbine vibrations); shut down starting on 30 May, for work on turbine couplings and on the "glove fingers" of the core instrumentation.
Blayas 1	Shut down since 13 April, for partial inspection and recharging.
Bugey 3	Shut down since 12 April, for five-year inspection and recharging.
Chinon B2	Shut down since 10 May for complete inspection and recharging.
Cruas Meysse 1	Shut down since 20 April, for complete inspection and recharging.
Cruas Meysse 4	Shut down from 11 to 26 May, for work on primary and secondary circuit equipment.
Dampierre 1	Returned to the network on 31 May, after being shut down since 21 April for partial inspection and recharging.

Fessenheim 2	Shut down since 27 April, for five-year inspection and recharging.
Gravelines 4	Returned to the network on 4 May, after shutdown for work on a steam generator (primary/secondary leak) since 26 April; shutdown since 25 May for partial inspection and recharging.
Tricastin 1	Shutdown since 27 April for partial inspection and recharging.
Chinon A3	Extended shutdown since 5 May 1984, for repairs of the reactor internal structures.
St-Laurent A1	Shut down since 12 April for general inspection.
St-Laurent A2	Shut down since 27 April for routine inspection.
Phenix	Partial-charge operation (sodium leak in an intermediate exchanger).

9294
CSO: 5100/2569

FRANCE

PLANS FOR SUPERPHENIX-2 DESCRIBED, IMPROVED DESIGN

Paris AFP SCIENCES in French 6 Jun 85 pp 61-63

[Article: "Superphenix: Divergence Around 15 September"]

[Text] Paris--If all goes well, the Superphenix breeder reactor should diverge around 15 September, be connected to the EDF [French Electricity Company] around 15 January 1986, and placed in industrial operation in April, it was announced on 5 June by Mr Gerard Renon, general director of the CEA [Atomic Energy Commission] which has been supervising the project since its inception in 1973.

This fast-neutron 1,200-MW reactor operating on plutonium is being built at Creys-Malville (Ain), 50 km upstream from Lyons on the Rhone. In recent weeks, it experienced a few technical problems, vibrations of unexpected amplitude due to the flow of the vessel coolant sodium. The problem was solved without upsetting the schedule too much.

This week, the installation of the control rods that control the reactor operation will be completed, and the steam generators will be filled with water. Next week, sodium--the coolant used in breeder reactors--will be added to the last two cooling loops. This will be completed on 10 June.

Superphenix will operate for 1 year under close supervision of experts, who must submit a report to the government so it can decide with full knowledge of the facts whether to start construction of a second, more powerful, 1,500-MW reactor for which studies are now actively pursued at the CEA, the EDF and at Novatome.

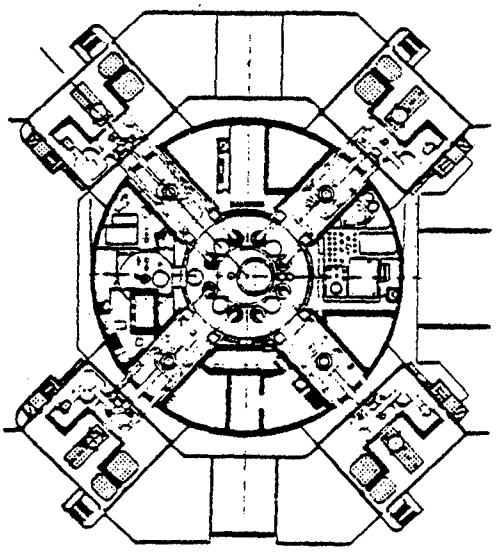
The Post-Superphenix Era

This reactor, which is called Superphenix-2 or, better, RNR 1,500 (fast-neutron reactor 1,500), will benefit from the progress and knowhow acquired since the Superphenix-1 reactor was designed.

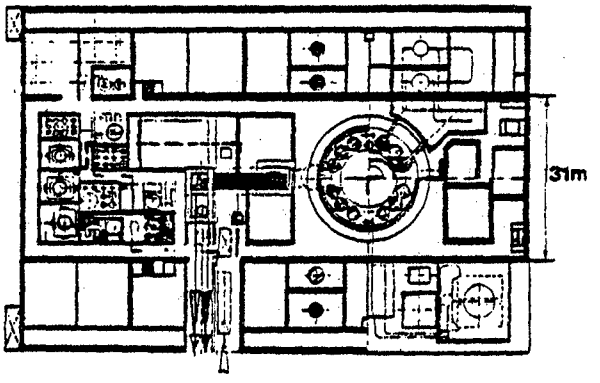
CEA experts estimate, for instance, that it will be possible to reduce the steel and concrete mass by 40 percent, to shorten the cooling loops, do without the steel dome that covers the Creys-Malville reactor, reduce the height of fuel assemblies, and obtain a flattened core by changing certain general principles and introducing detail changes that will affect the whole project.

Reactor Buildings

SUPERPHENIX 1



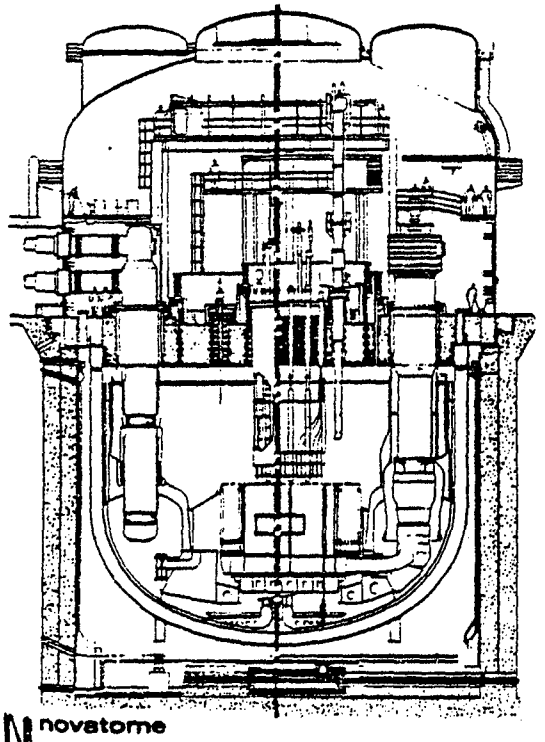
SUPERPHENIX 2



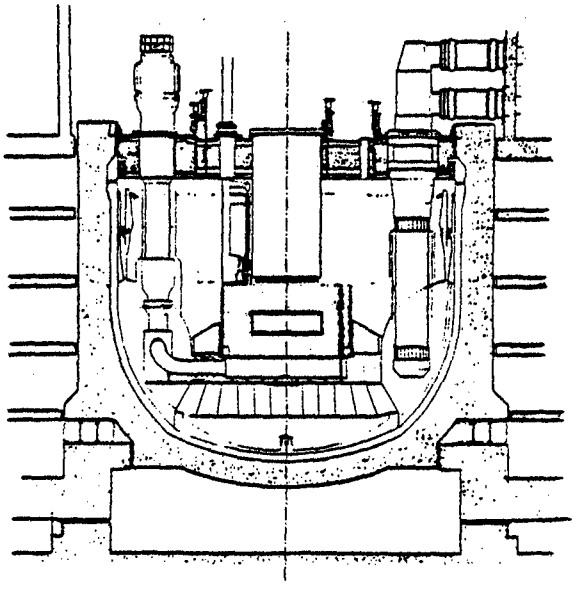
Reactor Blocks

Features	SPX1	SPX2
Main-vessel diameter	21 m	20 m
Steel weight	3,400 t	2,200 t

SUPERPHENIX 1



SUPERPHENIX 2



novatome

Materials savings equal cost reduction; all this to obtain more power and a price per kWh just a little over that obtained with the pressurized-water reactors of the traditional nuclear power-plants now in service. And while getting free of uranium-market constraints, uranium reserves being limited, and starting what might become a breeder reactor industry.

The 1,800-2,000 people working on the CEA project have one goal: to have a full dossier ready by the end of 1987, with at least 2 options as far as the project site is concerned--Creys-Malville near Superphenix, or Saint-Etienne-des-Gorts, near Marcoule (Gard)--so that excavation work could start already in 1988 and the reactor could be started in 1995 for 30 years or so.

In addition to this project which, as is the case for Superphenix, would be carried out in international cooperation with the electricity producers of five European countries (FRG, Italy, Great-Britain, Belgium and the Netherlands), there is a project for a reprocessing plant for the plutonium fuels used in breeder reactors all over Europe.

Although some cooperations already exist, technical and diplomatic maneuvers have already begun. All want to have this plant on their territory: the plant will need a reprocessing capacity of 50 tons per year of breeder-irradiated fuels, that will then be reused.

The French and the British are two candidates. A mini-plant, TOR [expansion unknown], installed at Marcoule, should be able to reprocess 5 tons of these fuels per year already next year. Thanks to the La Hague facilities, plutonium fuels have already been reused three times in the Phenix prototype reactor in Marcoule. The English also have a lot of experience and they, too, emphasize it.

9294
CSO: 5100/2567

FRANCE

VIBRATIONS AT SUPERPHENIX REQUIRE MODIFICATIONS

Paris AFP SCIENCES in French 13 Jun 85 pp 57-58

[Article: "'EPOC' Operation Ended Superphenix Vibration"]

[Text] Paris--Under the code name "EPOC," i.e. Study of Wave Phenomena in Superphenix Collectors, an effort was undertaken to study and find a solution to vibration problems that were observed already in November 1984 in the upper part of the Superphenix fast-neutron reactor vessel.

This "disclosure" was made to a few reporters who met on 11 June at the National Hydraulics Laboratory (LNH) at Chatou in the northern suburbs of Paris; the laboratory is a division of the Directorate of Studies and Research of EDF [French Electricity Company].

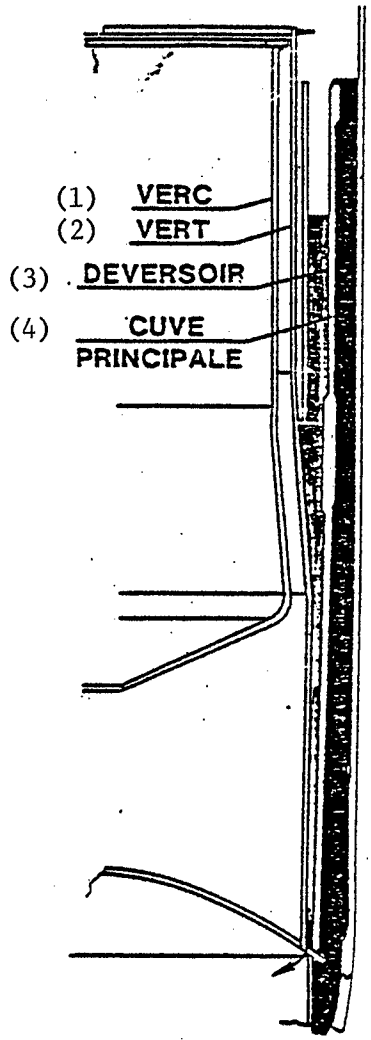
Mr Jean-Pierre Benque, head of the LNH division, acknowledged that "a rather brief study of vibrations had been made and an unsuspected instability phenomenon occurred. No one suspected that with a flexible wall (the sleeve separating hot sodium from cooler sodium) there would be flow instability problems. Novatome had requested a lot of studies on thermal gradients, but not on vibrations."

As soon as the vibrations were observed, Nersa, the contractor for the Creys-Malville power plant, requested an additional study from the LNH. And the cause of the vibrations was soon identified.

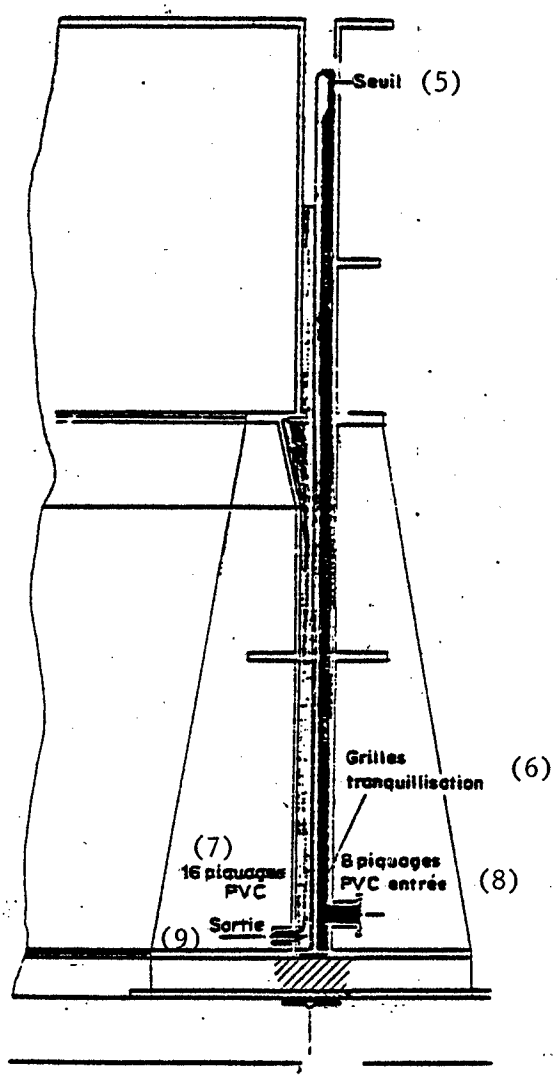
Then, at the request of the EDF Directorate of Equipment, Nersa and Novatome-Nira (prime contractor for the nuclear vessel), the LNH designed and made a 1/4-scale model of the top of the vessel. The reduced-scale model thus obtained is 5 m in diameter and 2 m high. Its cost: FF 600,000.

Since plexiglas was used--and water instead of sodium--and colorants added, the phenomena involved could be identified and visualized. The studies consisted, among other things, in causing two parameters to vary: the rate at which sodium was poured into a coolant circuit and the height from which it fell. Actually, LNH engineers managed to eliminate vibrations by varying these two quantities.

The LNH thus confirmed studies carried out simultaneously in the field, and there remained only to carry out full-scale tests. This was successfully



Superphenix Reactor



"EPOC" Model

Key:

1. "VERC"
2. Green
3. Pour outlet
4. Main vessel
5. Threshold
6. Steadying grids
7. 16 taps - PVC
8. 8 taps - PVC inlet
9. Outlet

done by the Creys-Malville engineering department and site engineers: since last May, the vibrations have totally disappeared.

The sodium flow was increased from 0.6 to 0.9 m^3/s and the pouring height reduced from 1.5 to 0.7 m. This involved alterations in the "legs" of 19 reactor-core assemblies.

In passing, note that the study and theoretical modelling of such phenomena is very complex. Existing mathematical models are inadequate and the process of interaction between fluids and the mechanical structure is still not well known. Nevertheless, this operation enabled the LNH to progress in this field and develop its first "fluid-structure" models.

The LNH was created in 1946; although most of its activities (about 70 percent) are carried out on behalf of EDF, it also makes studies for various public or private, French or foreign organizations: maritime services, basin authorities, Atomic Energy Commission, etc. It is also involved in teaching tasks at higher schools of engineering and welcomes nearly 100 trainees every year, several of them from abroad.

It possesses testing halls covering 20,000 m^2, with reduced-scale models of river or sea development facilities, including about 20 permanent facilities consisting of channels and tanks that can reproduce currents, tides and waves.

9294
CSO: 5100/2571

FRANCE

VIBRATIONS FOUND IN NEW 1300 MW REACTORS

Paris AFP SCIENCES in French 10 Jun 85 p 53

[Unsigned article]

[Text] Athens--Vibrations have occurred at the bottom of the 1300 MW reactors at new French nuclear plants, requiring very slight repairs, indicated on 13 June the president of Electricite de France (EDF), Marcel Boiteux.

The 900 MW installations built in recent years are not involved, but the schedule of the first 1300 MW units--notably at Paluel (Seine-Maritime in northwest France)--is slightly shifted, Mr Boiteux pointed out to several reporters during the International Congress of Electricity, UNIPEDE, held in Athens.

These vibrations, observed on tubes at the bottom of reactor vessels, create no danger, and according to Mr Boiteux the cost is almost negligible. With regard to the first two 1300 MW nuclear installations (Paluel 1 and 2) started in 1984, EDF indicates that Paluel 2 has been shut down for 11 weeks since 30 May, and Paluel 1 will be disconnected for two months on 8 July.

Shut-downs of about two months for inspection (routine after one year of operation) were planned in any case, EDF points out. Moreover, these inspections are performed during the summer, when the plants operate at reduced load because of lower demand.

By the same token, the network connection of reactors at the Flamanville (Manche, northwest France) and Saint Alban (south of Lyon, southwest France) plants, planned for the forthcoming months, will be slightly delayed, thus forcing EDF to use more coal during the bad season than had originally been expected.

These vibrations, explains Mr Boiteux, were detected at the bottom of reactor vessels, at the tubes (called "glove fingers") which penetrate the walls. Probes introduced into these tubes "measure the neutron flux in the reactor"

and verify that everything works normally. But these tubes, longer than those of in the 900 MW reactors, vibrate and are thus in danger of eventually breaking. No leak is normally possible (the tubes being plugged), except if the accident occurs at the time a probe is introduced, specifies EDF.

The tubes will be braced so as to stop the vibrations, explained Mr Boiteux.

This type of incident is due to "the sins of youth" of a new generation of reactors, EDF believes.

11,023
CSO: 5100/2570

FRANCE

SIPRI NOTES SECRET REPORT ON GEOLOGICAL CONDITIONS

Paris AFP SCIENCES in French 10 Jun 85 p 61

[Unsigned article]

[Excerpts] Stockholm--The Stockholm International Peace Research Institute (SIPRI) indicates that 53 underground nuclear explosions were recorded in the world during 1984, compared to 50 during 1983.

The Soviet Union leads the list of five nuclear nations with 27 tests, the same number as in 1983. The United States made 15 tests (14 in 1983), France made seven (seven), Great-Britain two (one), and China two (one).

No test exceeded 150 kilotons, in accordance with the 1974 American-Soviet Nuclear Test Limitation Treaty, following the 1963 treaty which neither France nor China have yet signed.

One-third of the Soviet tests were conducted on the Semipalatinsk plateau, in eastern Kazakhstan. Moreover, another third of the Soviet tests were carried out beyond the listed sites because they were designed for civilian purposes. In fact, the USSR has used atomic bombs to blast out tanks for storing natural gas.

Regarding the French tests at the Muroroa atoll in Polynesia, SIPRI observes that they are still being severely criticized by some governments and non-governmental organizations. The annual report also mentions that the scientific commission invited by France to investigate at Muroroa, has noted in its conclusions that no radioactive danger existed at the Polynesian site at that time.

SIPRI lastly notes that the Australian foreign affairs minister disclosed in November 1984 the existence of a French secret report about geological conditions on mainland France aimed at conducting French nuclear tests. This report indicated that there was no technical obstacle to testing on the mainland, and mentioned in this regard sites at Gueret and Mageride in the Massif Central.

11,023
CSO: 5100/2570

FRANCE

COGEMA CITES LASER IN COMPETITION FOR ENRICHMENT CONTRACTS

Paris AFP SCIENCES in French 30 May 85 pp 36-37

[Article: "Battle for the Enriched-Uranium Market"]

[Text] Tokyo--The battle for uranium-enrichment contracts goes on and is even reviving, although the world market has been somewhat dull for years as a result of slowdowns in nuclear programs.

COGEMA [General Nuclear-Materials Company], which provides fissile materials (uranium, fuels, etc.) and various services (enriching, reprocessing, etc.) to over 100 power reactors throughout the world (one third of the world total) has selected Japan, where it is the leading French exporter with sales of FF 2.5 billion (including FF 800 million for enriched uranium, and a large part for fuels and reprocessing), to announce on 29 May to some 100 Japanese government and electro-nuclear industry officials that it will "very probably be in a position to enrich uranium by laser at the end of the next decade, and even before that if it should prove necessary."

"We are entering the second stage of our sales of enriched uranium to Japan and negotiating new contracts for the next decade," Mr Jean-Pierre Rougeau, COGEMA marketing and sales director, told the press. "During the completion of these new contracts, new enrichment processes are sure to emerge, and we wanted to inform our Japanese clients that the CEA [Atomic Energy Commission] (of which COGEMA is a fully-owned subsidiary) had adopted laser enrichment."

Mr Rougeau did not conceal that COGEMA's announcement that, if needed, it will probably have laser-enrichment means during the next decade, had a triple goal:

-to publicize the fact that the Americans, "which are putting pressure" on the Japanese to renew their own contracts with Japanese electricity producers, would not be the only ones to have more efficient enrichment plants;

- that "we shall remain competitive as far as enrichment costs are concerned"; these could probably be reduced by half compared with today's costs;

- that it was "a real bluff" on the part of the Americans to announce that they will manage to offer SWU (the separation work unit) (Editor's note: it takes 300,000 SWU to produce enriched uranium for a 1,000-MW nuclear power

plant) at a cost ranging from $25 to $49 (compared with $130 as currently charged by the U.S. Department of Energy). Enriched uranium produced by Eurodif, the European uranium-enrichment plant located at Pierrelatte, sells for about $100 per SWU.

Another reason that probably played a part in the announcement made by COGEMA describing French research in the field of laser enrichment is that the U.S. Department of Energy (DOE) is about to announce what new enrichment process it has selected for its future plant.*

Quite probably, the process selected will be the AVLIS process (Atomic Vapor Laser Isotopic Separation) rather than ultracentrifuging. AVLIS, or SILVA in French (Atomic-Vapor Laser Isotope Separation) is precisely the process favored by CEA researchers since, for instance--as was indicated by Mr Claude Bernaud, director of the Isotope-Separation and Physical Chemistry Research Division of the CEA--of the total of FF 400 million provided for enrichment studies in 1985, FF 250 million will be devoted to it.

Two other new enrichment processes which are being developed, the laser molecular process and the plasma process, appear much less promising.

Any uranium enrichment operation amounts essentially to separating uranium 235, which alone is fissile, from uranium 238, which is not. But the proportion of uranium 235 compared with uranium 238 is very small. Whereas gaseous diffusion (Eurodif plant) involves circulating a uranium gas many times through extremely fine membranes (uranium 235, being lighter, diffuses faster and the gas gets progressively richer), the SILVA process is based on the property of the various atoms to be "excited" at different frequencies, so that it is possible to "get out" the uranium 235 ions by using a cascade of laser.

An AVLIS-based pilot is already in operation at Saclay. A second one, "more demonstrative," will be built next year. If the economic gain over diffusion is confirmed, a project for a 500,000-1 million SWU plant could be considered for the Pierrelatte site.

As for the 11-million-SWU plant of Eurodif, it will remain in operation for a long time, as transition from one plant to the other, which would be expanded by modules, would be very progressive.

If COGEMA's goal in the Japanese case is, on the one hand, to retain annual sales of 1 million SWU to that country, on the other hand, it also ambitions to increase these sales by conquering one third of its own shipments to that country, i.e. 30 percent of the 4 million SWU, over its main, not to say its only competitor, the U.S. Department of Energy.

It is also obvious that, for all other clients, including the French Electricity Company, a reduction of enrichment costs in 10 to 15 years will be welcome, as other expenditures will increase the cost of nuclear power, for instance the tearing down of obsolete power plants.

9294
CSO: 5100/2568

* See AFP SCIENCES No. 457 dated 23 May 1985, p 46.

FRANCE

'INFLEXIBLE' FEATURES NOTED, NEXT GENERATION PLANNED

Paris AFP SCIENCES in French 30 May 85 pp 42-43

[Article: "The 'Inflexible,' the Most Advanced French Nuclear Submarine"]

[Text] L'Ile-Longue--The nuclear submarine "Inflexible" left the Ile-Longue port on 25 May on a first mission that will last a little over two months, thus tripling the number of French strategic nuclear warheads under the ocean.

A little over 1 hour after President Francois Mitterrand's visit on board, the 6th French guide-missile nuclear submarine (SNLE) got under way around 13:30 with its 127 men and carrying a 15,000-kiloton atomic load distributed in 16 multiple-head missiles.

It is provided with remarkable improvements over the first five SNLEs, especially as far as acoustic discretion and electronic and data-processing equipment are concerned, and due to the fact that, in addition to traditional torpedoes, it is carrying the submarine version of the Exocet, the "SM-39" (which also equips the two nuclear attack submarines, the "Rubis" and the "Saphir").

The "Inflexible," which looks like a big fish 128.7 m long and 10.6 m wide, has a surface displacement of 8,080 tons and an underwater displacement of 8,920 tons. It can travel at over 20 knots thanks to its nuclear reactor.

Another submarine--the construction of which was decided in 1981--should be placed in service around 1995. It would be of a new design as far as acoustic discretion is concerned.

9294
CSO: 5100/2568

FRANCE

PLUTONIUM ADDITION TO PWR'S PLANNED FOR 1987

Paris AFP SCIENCES in French 13 Jun 85 pp 59-60

[Article: "EDF Taking up Plutonium Recycling"]

[Text] Paris--The French Electricity Company [EDF] just decided to add plutonium to power-plant pressurized-water reactors so as to reduce by 3 to 4 percent the cost of the fuel cycle, an EDF spokesman indicated on 11 June.

The first 8 tons of fuels will be charged into a 900-MW reactor late in 1987, in a unit of one of these power plants. After that, plutonium will be progressively added until it reaches an amount of close to 90 tons in 1995, which represents the charge of 10 reactors, as provided by the COGEMA [General Nuclear Materials Company] program.

According to the same source, EDF has not yet selected the first unit, which could be in any of 16 power plants. Traditional nuclear power plants, it was pointed out, operate with enriched uranium.

According to EDF, the addition of plutonium into pressurized-water reactors will not pose any technical problem; the Germans in particular have already done it. Isolated tests were also made in France about 10 years ago, in particular at Chooz, on the French-Belgian border.

Because of the development program of the fast-neutron reactor system, EDF pointed out, the use of plutonium until now had been reserved to these reactors, in which it can act as a breeder.

But there will soon be an oversupply of plutonium over and above the needs of fast-neutron reactors, and EDF had to decide what was the best possible way to use these irradiated fuels.

For the past two years, EDF has carried out studies that led to the decision of recycling plutonium in reactors of the light-water type and to use the uranium obtained through reprocessing as a substitute for natural uranium.

9294
CSO: 5100/2571

BRIEFS

ENRICHED URANIUM FOR INDIA--About 10 tons of enriched uranium, a nuclear fuel to be used at the Tarapur power plant near Bombay, were air-shipped to India from France, the United News of India (UNI) agency reported on 25 May. A French-Indian agreement covering shipment of nuclear fuel to the Tarapur power plant was signed in 1982. The agreement also provides for an exchange of non-classified information on research and development, including the advanced technology of plutonium use. The two Tarapur reactors were built by the U.S. company General Electric under an Indian-U.S. agreement signed in 1963, which provided for deliveries of U.S. enriched uranium until 1993. But U.S. shipments became few and far between after 1974, when India tested a nuclear bomb, and stopped altogether in 1981 when India refused to agree to guarantees requested by the United States. [Text] [Paris AFP SCIENCES in French 30 May 85 p 40] 9294

ENRICHED URANIUM FOR SWITZERLAND--On 22 May, the Federal Council (the government) decided to transfer to a warehouse in the north of Switzerland a stock of 182 tons of enriched uranium now stored at Pierrelate (Drome) in France. The stock belongs to the company in charge of operating the projected nuclear power plant of Kaiseraugst (ENK [expansion unknown]), in Aargau (northern Switzerland), a power plant that has been much questioned for over 10 years by a large part of the Swiss people and by the Basel and Solothurn cantons, which border on Aargau. The Federal Council thus agreed to the request of ENK, which since 1981 had wished to lease from the Confederation the closed-down building of the Federal Institute for Reactor Research (IFR) at Wueranlingen (Aargau). To-date, 1,182 objections to this request were expressed. But the Federal Council estimated that there was now nothing to stand in the way of the implementation of this project which offers "no risk either for man or for the environment." However, this decision will still have to be ratified by Parliament. [Text] [Paris AFP SCIENCES in French 23 May 85 p 47] 9294

FESSENHEIM REPORTS GOOD YEAR--With a 1984 production of 12.96 billion of kWh, the Fessenheim nuclear power plant has had its best year since 1977, it was stated in the annual information report published on 16 May by the management. According to the report, the increase from 8 billion kWh in 1982 to 10 billion in 1983 is accounted for by "a reduction in the annual shutdown time for recharging" and by a more regular operation of the units the rest of the time. Total expenditures amounted to FF 1.435 billion, including 117 million

for orders placed with outside companies. The cost per kWh declined from 13.36 centimes in 1983 to 11.07 in 1984. There were also fewer work-related injuries (5 in 1984). The report also indicates that "there was no change in the radioactivity level around the power plant," which now employes 451 agents. [Text] [Paris AFP SCIENCES in French 23 May 85 p 48] 9294

CIVAUX CONSTRUCTION TO BEGIN--On 1 June, in Poitiers, Mrs Edith Cresson, minister of industrial redeployment and foreign trade, indicated that work at the Civaux power-plant site (Vienne) would last 11 years. According to the minister, construction of the two 1,500-MW units of the power plant, which will start on 1 October, will require 20 million work-hours. It will cost FF 15 billion. Mrs Edith Cresson pointed out that "Civaux will be an entirely French-designed power plant." The power plant, on the banks of the Vienne some 30 km southeast of Poitiers, will consist of two 1,400-MW units of the "light water" pressurized reactor type using slightly enriched uranium. After being thrown back into question when cuts were made in the French electronuclear program, its construction was confirmed by the president of the Republic when he visited the Poitou-Charentes region in November 1983. [Text] [Paris AFP SCIENCES in French 6 Jun 85 p 66] 9294

SGN-FRG REPROCESSING PLANT--The French company SGN (Saint-Gobain Nuclear) will share in the construction of the Wackersdorf nuclear reprocessing plant (Bavaria, in southern FRG), it was announced on 3 June by the management of the West German Nuclear-Fuel Reprocessing Company (DWK). The chairman of the managing board of that company, Mr Guenther Scheuten, indicated that, considering its experience in this sector in France, SGN would be responsible for certain planning tasks. The Wackersdorf plant, which will be built in cooperation with another 8 or so German firms, represents a total project cost of DM 5.2 billion (about FF 16 billion). According to Mr Scheuten, it should be placed in service in 1995. [Text] [Paris AFP SCIENCES in French 6 Jun 85 p 66] 9294

CHINON-A2 SHUT DOWN PERMANENTLY--Tours--An announcement from Electricite de France (EDF) states that the A2 reactor of the Chinon (Indre-et-Loire) nuclear plant was permanently turned off on 14 June. The shut-down of this 250 MW installation, decided by the EDF board of directors in March 1984, "is a natural part of the studies to optimize the production facilities of thermal, conventional, or nuclear power plants," indicates the announcement. This natural uranium, graphite-gas unit was placed in service in 1965. Since then, the A2 installation has operated for 131.850 hours and produced 23.6 billion kilowatt-hours. Its mean availability was 70 percent and it consumed 1.350 tons of uranium. After the shut-down of the Chinon A1 reactor in April 1973--the symbol of France's nuclear electricity production, which has been turned into a museum since that time--three installations have remained active at the site: A3 (500 MW graphite-gas), B1, and B2 (9000 MW PWR-type installations). Two others, B3 and B4 (900 MW PWR) are scheduled to be started in 1986-1987. [Text] [Paris AFP SCIENCES in French 10 Jun 85 p 63] 11,023

CSO: 5100/2570

NETHERLANDS

U.S. CONCESSIONS IN GENEVA NEEDED FOR NONPROLIFERATION

Rotterdam NRC HANDELSBLAD in Dutch 1 Jul 85 p 9

[Commentary by An Salomonson in the column "On the Other Hand": "Non-Nuclear Arms States of the World, Unite"]

[Text] In 2 months the 128 signatory states of the Nonproliferation Treaty will turn up in Geneva to study how the treaty has been complied with. In that treaty the non-nuclear arms states obligated themselves not to acquire nuclear arms, in return for peaceful nuclear technology. The nuclear arms states promised to negotiate on rapid and drastic arms control agreements.

The first promise has been kept. No new nuclear arms have been added to the list (although a number of countries are on the threshhold). The second promise, on the other hand, has not been kept: the superpowers have reached no new agreements since the Salt I and ABM treaties of 1972. Salt II was never ratified. Nothing suggests that the Soviet-American talks in Geneva will produce any result in the foreseeable future.

This failure casts a dark shadow over the upcoming follow-up conference. The displeasure of the Nonaligned countries has in the meantime turned to such rage that it appears possible the Nonproliferation treaty will collapse. If the superpowers do not make an unambiguous gesture at the follow-up conference to show that they want to save the Nonproliferation Treaty and that they are serious about arms control, a whole series of Nonaligned countries could well carry out their threat to denounce the treaty.

Such a gesture can occur in only 1 sector as long as the bilateral negotiations are unsuccessful. That is in the area of a total test ban, a ban that is on underground nuclear tests (they are already forbidden above ground, under water, and in space). Such a ban is a relatively simple way of condemning the nuclear arms arsenals to a slow death by suffocation. Just as with things around the house, so too, you see, for nuclear weapons it is necessary from time to time to renew or replace them, because otherwise they become unusable with the passage of time. Keeping them up to date in this way requires test explosions. If they are banned, then the existing systems become untrustworthy, and new ones can no longer be tested. The weapons spiral comes automatically to an end.

There has been talk about a test ban ever since the Nonproliferation Treaty was signed in 1968. In the preamble it even calls for a test ban in so many words. For that reason it has gained symbolic significance. At the end of the 1970's negotiations on the ban were almost complete when the Americans broke them off unilaterally, officially in reprisal for the Russian invasion of Afghanistan, in reality probably because the political will was lacking.

Since then there has been a total impasse. The Soviets proclaim loud and clear that they are for such a test ban. Whether they mean that is difficult to test as long as the Americans are unwilling to talk about it. The latter argue that such a test ban is realistic only in the context of a broad arms control agreement. Test explosions can be done away with, they say, only when the entire disarmament process is well underway. Repeatedly the American government has declared that a test ban is not a priority and is considered only a long-term goal.

How much bitterness this has caused became clear at the end of last week (again) in Geneva, where Prince Saddrudin Aga Khan and his "Groupe de Bellerive" had organized a colloquium on nuclear proliferation as an introduction to the follow-up conference. There were speeches by VIP's like Arbatov, Anatoli Gromyko, Perle, Kennedy, Owen, Palme, Crown Prince Hassan of Jordan, former President Perez of Venezuela, the Egyptian Shaker who will chair the follow-up conference, not to mention our own Theo van Boven. Guest of honor was Vice President Bush. 500 politicians, UN officials, and non-governmental organizations participated in the discussion.

It was dominated by a single thought: only a test ban treaty can still save the Nonproliferation Treaty. As one man the speakers demanded (except of course for Perle and Bush) that the United States and the Soviet Union cross that bridge (together). The contrast this time was not between East and West or North and South. A broad front of non-nuclear arms states formed against the superpowers "that can murder all of us" (in Palme's words).

Naturally nobody believes that America will turn around from one day to the next. Washington and Moscow are much too far apart in their positions for there to be a substantial concession. Still, they must be very interested in stopping proliferation. Even a small, poor country can put a superpower in checkmate with a primitive nuclear weapon.

Even a small concession would satisfy the non-nuclear arms states at the follow-up conference. Such a concession might consist of a moratorium on tests of over, say, 10 kilotons; or of a unilateral promise not to carry out any tests for 1 year as a sign of good will; or of an exploratory mandate to the UN Disarmament Commission in Geneva for a test ban treaty (to prepare a negotiating mandate). Very modest concessions, as I said.

Activities like those of Aga Khan have no direct significance politically but do have an indirect one. They help to sensitize world opinion--and thus governments. All the delegations that will be leaving soon for the follow-up conference now know that the non-nuclear arms states will rise

in revolt if there is no concession on a test ban. And that in that case no consensus will be reached on a final communique, and that the follow-up conference will then end with the same setback as 5 years ago. It is just that this time that means the end of the Nonproliferation Treaty. Nuclear anarchy then lies before all of us.

President Reagan holds the Old Maid in his hand in this macabre game. He can take an oh-so-modest step in the direction of arms control. Or he can keep all his options for new weapons systems open. For new cruise missiles, so small that they are hard to count and thus cannot be verified. Or for laser beams in space, pumped up by a series of small nuclear explosions. In doing that he would not only be trampling on all existing arms control agreements, he would also be making new ones impossible and besides that undermining the Nonproliferation Treaty.

There was not much to laugh about in Geneva.

12593
CSO: 5100/2565

NUCLEAR TECHNOLOGY SMUGGLER JAILED

The Hague ANP NEWS BULLETIN in English 3 Jul 85 p 4

[Text] Alkmaar, 2 Jul--A Dutch company director was today sentenced to 12 months in prison for trying to export technological equipment to Pakistan which could be used in the development of a nuclear bomb.

The prosecutor told the Alkmaar court that Henk Slebos, 42, attempted in October 1983 to export an oscilloscope to Pakistan without the compulsory Dutch export licence. But the shipment was intercepted by customs officers at Schiphol airport.

Prosecutor F. Visser said Slebos intended to supply the oscilloscope which Dutch experts said could help in developing a nuclear bomb, to his former student friend, Dr Abdul Qadir Khan, a Pakistani nuclear scientist who was convicted by a Dutch court in November 1983 for attempted nuclear espionage.

Khan was sentenced in his absence by an Amsterdam court to four years in jail for attempting to gain uranium enrichment technology in the Netherlands. But in March this year, the court upheld an appeal by Khan because it found the public prosecutor's office had failed sufficiently to ensure that its summons against Khan had actually arrived in Pakistan.

Khan had denied spying in a letter to the Dutch Government.

CSO: 5100/2573

SPAIN

ASCO II POWER PLANT SANCTIONED FOR SAFETY INFRACTIONS

Madrid MERCADO in Spanish 17 May 85 pp 23-24

[Text] The Asco II nuclear power plant will be cited and, in all likelihood, penalized with a severe fine because of noncompliance with its obligations to inform the CSN [Nuclear Safety Council] about a matter as sensitive as the monitoring status of the land on which the power plant is built. This will not be the first case of a fine being levied against a nuclear power plant in Spain: Almaraz was fined 4.5 million pesetas for instances of noncompliance which were considered significant. It is not yet known what fine will be levied against Asco II. This facility is owned by FECSA (40 percent), ENHER (40 percent), Hidroelectrica Espanola (15 percent), and SEGRE (5 percent).

The reason for this citation may be considered technically minor, but it is certainly a sensitive matter in terms of the plant's safety. Previous studies conducted by the CSN showed that the soil on which Asco II is built is subject to a very slow but constant elevation of the ground which, if precautions are not taken, could render the plant unusable. The geological explanation is that the soil contains a series of marl rocks which expand with moisture. This problem was detected in due time and the owners were notified that, if special steps were not taken, the plant would not be issued the permits required for fuelling and start of operation.

Special Monitoring

These special steps, an essential condition to guarantee the complete safety of this nuclear facility, consist of placing in the soil approximately 600 measurement and control points to detect with precision any abnormal movement of the soil during the next 3 years. These points were to be installed before the loading of the fuel, or if not, their non-installation should have been fully justified, and their installation in the immediate future should have been guaranteed.

Before loading the fuel, CSN technicians found to their surprise that all the control and monitoring points had been installed.., except for four; no explanation or guarantees had been filed for the latter points at all. The

CSN had not been notified of such an anomaly, and this negligence naturally produced amazement at the ministry of industry when it was informed, and within the council itself. The fuel loading was halted until the proper guarantees were issued, and a decision was made to open a violations dossier on the plant's owners.

Authorized sources explained to MERCADO that the problem of the "rising terrain" at Asco is not a cause of concern "so long as suitable safety measures are taken, as if measurements of the area were to show any alarming indices, the unit would immediately be halted." Nonetheless, despite the minor technical gravity of the negligence discovered, the same sources did not conceal their concern, as "this noncompliance might be repeated, and that could lead to Asco's final shutdown. The lack of coordination between the groups building the plant is much more dangerous than any risk of radiation."

Extended Moratorium

The Asco II case came at the same time as the decision by the energy authorities to extend for 1 more year the so-called "nuclear moratorium," as it has become clear that the present number of nuclear plants is sufficient to cover electricity demand. That decision will again be reviewed next year, though it is unlikely that it will be any different in 1986 from this year's decision. Trends in electricity demand during the first months of this year (a 1.4 percent increase) seem to show that the energy experts at the ministry of industry were right. They had always maintained that the rise in demand in 1984 was due to an abnormal behavior of electricity-intensive industries, and that this pattern would not be repeated.

The electricity companies seem to have already resigned themselves to the rationality of what is called the "nuclear moratorium," in the conviction that the fundamental thing, acceptance of nuclear energy, has already come about. "Nuclear energy was a Francoist policy in the past; now it has become socialist," a noted member of the Spanish nuclear club recently commented. That is excellent consolation.

7679
CSO: 5100/2572

SPAIN

INFRACTIONS AT ALMARAZ POWER PLANT; SABOTAGE POSSIBLE

Madrid TIEMPO in Spanish 3 Jun 85 pp 46-57

[Article by Jesus Rivases]

[Text] The Almaraz nuclear power plant, in which a generator valve failed some weeks ago, was fined last year for up to four violations. The authorities were not properly informed about the incidents occurring at the plant, which may also have been the target of sabotage in 1983.

Monday, 13 May 1985. At 2330, near the small town of Almaraz (Caceres) people heard a loud crash or explosion--no one could agree about its exact intensity--coming from the nuclear power plant located a little over 1.5 kilometer from this town of 1,318 inhabitants. A relief valve of the generator had failed, and so the first of its five safety valves began to operate. The noise, a direct result of this, produced a certain amount of alarm in the nearby town.

All of the nuclear power plants now existing in Spain--there are seven in operation--are required to report by telex to the CSN [Nuclear Safety Council] every day on their operation and on any possible incidents occurring during that 24-hour period. But 12 hours after the failure of the relief valve, at 0930 in the morning of Tuesday, 14 May, the CSN received a telex from this plant stating: "Nuclear tests were completed without any change." This is a reference to some tests done at 3 percent power of the reactor's startup sequence. We should note here that nuclear power plants do not start up all at once, but do so gradually, at given percentages of power, until 100 percent is reached and the plant is connected to the national electricity system.

On that same day at 1750, one of the plant's officials telephoned the CSN to report that this failure had occurred the previous night. No one received any further information until the next day at 1330, when the council received another telex stating that "checkout of the damages to the safety valves of the steam generators is continuing," without any reference to the incident. Given this situation, the council decided to send a team of inspectors to the plant, who went to Almaraz that same day. On Thursday,

16 May, the full Nuclear Safety Council met, as it does every Thursday. All its members were in attendance: the president, Francisco Pascual Martinez; the members, Federico Goded, Luis Gutierrez, Donato Fuejo, and Eduardo Gonzalez, plus the secretary general, who is entitled to speak but who has no vote, Eugenio Vela. They agreed to halt operations at the Almaraz nuclear plant for the time being. The plant is owned in equal shares of 33 percent by Hidroelectrica Espanola, Union Electrica, and Sevillana de Electricidad.

The team of inspectors returned to Madrid on Friday, 17 May and prepared a report which the full council studied in a special session on Monday, 20 May. They decided to authorize a restart of the startup sequence for Unit II and proposed to the ministry of industry and energy that "a violations dossier be opened for this plant. This was described technically as a serious infraction to the maximum degree, for noncompliance with regulations on nuclear and radioactive facilities, in a recurring form, with regard to the information due to the appropriate authorities."

According to the Nuclear Safety Council's inspection report, "safety conditions at the plant and control of operations in progress were maintained at all times, and the event created no risk to the plant's personnel or to the exterior." The report further states that, according to the documentation provided, the plant proceeded with the repair of the generator's relief valve--the cause of this incident--and with the necessary related actions. Nonetheless, the inspectors also found that the valve failure was not recorded, as is required, in the daily operations log of the Almaraz nuclear power plant.

Penalty

This lack of communication, which the council termed a "serious infraction to the maximum degree," could earn the firms which own the plant a penalty of approximately 7 million pesetas, which would be imposed by the ministry of industry and energy, if they use the same criteria which have been used on similar occasions in the past. Nonetheless, we must say that there has also been an implicit penalty, one which is much more costly to the plant's owners. The plant was shut down for somewhat over 5 days. According to nuclear energy specialists, for each day that a nuclear power plant remains idle, the owners fail to take in about 100 million pesetas. In this case, with over 5 days down, this could mean that the Almaraz plant lost between 5 and 6 million pesetas. Therefore, halting operations was a greater penalty than the fine that might be imposed.

Antonio Bustamante, one of the plant's top officials, explained to this magazine that there was never any danger to anyone, either the workers at the plant or the people living nearby. "The failure," he said, "did not involve any radioactive systems." According to Antonio Bustamante, the relief valve failure occurred because the membrane it contains had a small opening, and was not in good condition. This valve is equipped with a silencer.

When the steam entered it, this caused the loud noise. Antonio Bustamante said this might be compared with the operation of a pressure cooker. When a particular pressure is reached, the valve starts to operate and the usual whistling sound is heard. In the case of the plant, which uses pressures and quantities that are far higher, the pressure cooker's whistling became an explosion.

In the recent history of the Almaraz nuclear power plant there have been a number of problems in dealings with the CSN, leading in 1984 to four proposals for penalties.

Incidents

Throughout 1984, the Almaraz plant repeatedly omitted to provide the information due to the CSN on nuclear safety and protection of the facility. The council cited four situations as "noncompliance with technical specifications."

According to the council reports, on 29 November 1983 there was an incident in Unit I, "without consequences in relation to safety," in which there was chemical contamination of the water in the secondary circuit, but the CSN did not receive the information it should have from the plant, as is required, at the appropriate time.

The report which the council later prepared states that "at about 1800 on 29 November contamination of the secondary circuit of Unit I was detected. This may have been caused by the addition of about 15 liters of concentrated sulfuric acid. Operations were halted and action was initiated to decontaminate the circuit. When the requisite water quality had reached the established limits, operations were resumed on 13 December. At the start of the year [1984] the reactor will be shut down for refueling. At that time the steam generators' tubes will be inspected."

At that time there was speculation about the possibility of sabotage, and the incident was even turned over to the police, who began an investigation to try to determine if this actually was an act of sabotage, and who might have been directly responsible. Nevertheless, the sources we consulted said that nothing new has yet been ascertained.

On 2 March 1984 a new fuel element fell during the refueling of Unit I. This element was being moved at the time, and had been improperly positioned. A later examination showed that there was no damage. This incident was not reported to the CSN until 6 days afterward, by telephone.

On 16 March 1984 the council reported that on 23 February a loose part of unknown origin and characteristics was discovered between the bushing and casing of a steam generator. The item was removed almost a month afterward by a team specially recruited and sent by the major contractor.

Omission of Information

Also on 16 March 1984, the Nuclear Safety Council found that operating tests had been conducted since 27 January 1984 at full power and at reduced temperatures in Unit II, as part of a program to test the plant at full power, in order to optimize the plant's operation and reach theoretical efficiency. None of these tests was reported to the council at the appropriate time, as required by the regulations.

Because of all these incidents, described as "noncompliance" and "omission of required information," the Nuclear Safety Council proposed to the general division of energy of the ministry of industry and energy that a fine be imposed on the Almaraz nuclear power plant. The fine levied was 4 million pesetas.

Inspections

During 1984 the technical staff of the CSN conducted a total of 129 inspections of nuclear power plants in operation, and 96 of nuclear power plants under construction. It is worthwhile noting that, of those already in operation, almost half of them were inspections of two plants: Cofrentes, which held the record of 40 inspections just in the second half of the year, and 26 of the two units at Almaraz. Only Asco, with 21 inspections, even came close, for there were only 12 inspections of Santa Maria de Garona and 15 at the Jose Cabrera and Vandellos I facilities. A number of the incidents just cited were found during some of these inspections.

At the end of December 1984, the Nuclear Safety Council gave a favorable recommendation for granting a new extension of the operating permit for Unit I at Almaraz.

Fourth Extension

This extension will be valid until 31 July 1986--for 18 months. During this fourth extension, the plant must request its definitive operating permit. This extension will enable the plant, among other things, to "possess and store fuel elements of slightly enriched uranium for successive refuelings, operation of the Almaraz I unit, to possess, store, and use radioactive materials, nuclear substances, and radiation sources needed for the calibration, analysis, and testing done during the period of validity of the provisional operating permit."

At this time all the parties involved, with the exception of the neighbors of Almaraz and those who are opposed to nuclear energy, agree that there was never any danger to anyone. The plant's officials complain that this is essentially an administrative problem, involving formalities that should perhaps be revised. The CSN feels that it is essential that the regulations covering information be complied with, in case more serious problems should occur.

Some of the people living in the town of Almaraz complain that in this instance, without the loud noise at the plant, no one would have been told about what happened, as it could easily have been concealed. Finally, people opposed to nuclear energy insist that more rigorous control should be maintained than what exists at present, and that the Nuclear Safety Council itself, although responsible to the ministry of industry, is nothing more than another of the long arms of the electricity companies, which own the nuclear plants.

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UNITED KINGDOM

UK SPENT URANIUM SOLD TO ISRAEL BY LUXEMBOURG FIRM

London THE DAILY TELEGRAPH in English 12 Jul 85 p 24

[Article by David Adamson]

[Text]

A CONSIGNMENT of depleted uranium potential material for making nuclear explosives—was exported to Israel last autumn after it had been brought from British Nuclear Fuels by a Luxembourg firm.

The incident is the first detected breach of the 1968 Nuclear Non-Proliferation Treaty, to which Luxembourg is a party. Israel, which is not a signatory of the treaty, is widely believed to possess nuclear weapons but denies having them.

A Department of Energy spokeswoman confirmed yesterday that Britain had protested to Luxembourg about the transhipment to Israel of 40 tons of depleted uranium, spent fuel which British Nuclear Fuels believed would be used in making steel alloys in Luxembourg.

"Luxembourg is in no doubt of our view that the material was fully safeguarded when it left Britain and should have remained so," said the spokeswoman.

EEC check

The sale was spotted by the Luxembourg-based safeguards agency of Euratom, the European Community's nuclear agency, when it checked what had happened to sales of depleted uranium by Britain and other countries to International Metals S A.

The failure to notify Euratom of the sale was said by an E E C source yesterday to have been due to a "misunderstanding." It was discovered in a "period of somewhere between weeks and months."

The next step was to notify the Vienna-based International Atomic Energy Agency, which polices the Non-Proliferation Treaty. Israel, which has a safeguards agreement with the I A E A covering some of its nuclear establishments, invited the agency's inspectors to examine the depleted uranium.

Civil use

The inspectors saw what the I A E A describes as "the major part" of the material and were satisfied it was being used for civil purposes in making steel alloys.

Although an I A E A spokesman expressed no views on what had happened to the rest of it, Euraton appears to be satisfied that it, too, was used in manufacturing alloys.

According to Euraton, it would be difficult for Israel, given the current state of nuclear technology, to convert it into explosives.

Euraton and I A E A officials expressed relief yesterday that the system had worked to the extent that the sale was discovered relatively quickly. Nevertheless, talks on how to tighten it up to prevent banned goods from slipping through to non-signatories of the Non-Proliferation Treaty are continuing.

Euraton is said to be still unhappy with Luxembourg's response and Britain is refusing to sell any more depleted uranium until reliable controls are introduced.

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PARTY LEADER OWEN CALLS FOR NUCLEAR PACT WITH FRANCE

London THE DAILY TELEGRAPH in English 22 Jun 85 p 5

[Article by Nicholas Comfort]

[Text]

DR OWEN surprised colleagues in the SDP/Liberal Alliance yesterday by calling for Britain and France to open talks on ways of making their respective nuclear deterrents "more credible" through joint planning.

The SDP leader's remarks in a speech at Fontainebleau are certain to infuriate unilateralists in the Liberal party who are already stepping up their campaign against his readiness to see nuclear weapons retained.

But they are also likely to draw wider criticism within the Alliance, hose official compromise defence policy rests on the tacit assumption that the British deterrent, now in the form of Polaris Missiles, will wither away before too long.

Dr Owen, in his Fountainebleau speech, reiterated the Alliance, whose official compromise the Trident missile system being bought from America as the successor to Polaris, and predicted that it might be scrapped whoever won the next election.

'European destiny'

But he argued that if Trident were to be cancelled, "Anglo-French nuclear co-operation might come much higher on the political agenda."

The former Labour Secretary asked why, prior to the decision to take Trident, there had been no discussion with France on the possibility of Britain taking French submarine-launched ballistic missiles.

France had, now "caught up and probably surpassed" the British nuclear capability, and this meant that talks on nuclear defence co-operation could open without France feeling any sense of inferiority.

"It is ludicrous that the nuclear issue, and bilateral co-operation and collaboration, is not a major agenda item every time that a French President and British Prime Minister meet to discuss political issues," said Dr Owen.

The lack of talks aimed at understanding each other's strategic philosophy and for sharing knowledge and research costs was "an indictment of the way the two countries still see their European destiny.

"The key area now for Aglo-French discussions is not not the party political British debate about whether or not Britain should remain a nuclear weapon state," he said.

"That has little or no echo in France among political and military decision-makers.

"The real issue is how to give both our nuclear forces a more credible deterrent, and it is interesting that French public opinion polls suggest that the French public is far less certain and convinced about the validity of French nuclear thinking than French decision makers.

"There cannot be a shared command and control structure —the ultimate decision will have to reside with the French President and the British Prime Minister."

CSO: 5140/016

END