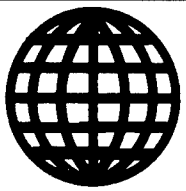


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Nuclear Developments

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Nuclear Developments

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Shanghai Scientists Develop Nuclear Probe

*OW2103013890 Beijing XINHUA in English
1448 GMT 20 Mar 90*

[Text] Beijing, March 20 (XINHUA)—Chinese scientists have developed a high-tech "nuclear probe."

According to today's CHINESE SCIENCE NEWS, the probe, now produced by only a few advanced countries, was developed by the Shanghai Institute of Nuclear Research of the Chinese Academy of Sciences.

The nuclear probe will be used for research in biology, medicine, geology, materials science, microelectronics, and archaeology.

Measures To Reduce Radiation Accidents Announced

*HK1003092290 Beijing CHINA DAILY in English
9 Mar 90 p 3*

[By staff reporter Zhu Baoxia]

[Text] Health administrative departments, public security, and environmental protection bureaus at all levels throughout the country are required this year to jointly conduct an inspection of units producing, marketing and using radioisotope and radiation equipment so as to reduce radiation accidents.

All units will be checked in line with the protection guidelines for radioisotope and radiation equipment that were promulgated by the State Council last October.

And any establishments without permission from departments in charge are forbidden to undertake radiation work.

The measures were announced by He Jiesheng, vice minister of Public Health, speaking in Beijing on Wednesday at a telephone conference to promote the

implementation of the protection principles and also the strengthening of sanitation supervision over radioactive materials.

The conference was jointly chaired by the Ministry of Public Health, the Ministry of Public Security, the National Environmental Protection Agency of China, and the Legislation Bureau under the State Council.

According to He, with the advancement of national economy, the country had developed rapidly in the application of radioisotope and radiation equipment.

Incomplete statistics revealed that the number of units using various radioisotopes had increased 20 times since the 1960s.

At present, the country has about 150,000 X-ray machines for medical use, more than 2,500 industrially-used flaw detectors as well as more than 300 kinds of accelerator.

The number of people in touch with radioactive rays is also growing.

About 160 million people receive radiation examinations and treatment annually.

The vice minister also mentioned that, although the State Council and relevant departments had issued temporary protection regulations and managerial measures for the field in the 1960s, many working staff knew little about the possible harmful effects of radioactive materials and their disposal methods due to insufficient publicity and education among the public.

Thus some of the radioactive materials were often stolen or lost and some had even led to injuries. About 221 accidents were reported between 1981 and 1985.

He stressed that training should be given to radiation sanitation supervisors at various levels in a bid to improve the quality of their work and scientific managerial standards.

INTER ASIAN

First Asian Nuclear Cooperation Forum Opens

Japan To Promote Cooperation

*OW1203075090 Tokyo KYODO in English 0701 GMT
12 Mar 90*

[Text] Tokyo, March 12 (KYODO)—Japan intends to take initiative in the promotion of nuclear power cooperation in Asia, Japan's science and technology minister told a gathering of senior Asian atomic energy officials Monday.

Tomoji Oshima, state minister in charge of the Science and Technology Agency, made the pledge in an opening address to the First International Conference for Nuclear Cooperation in Asia, sponsored by Japan's Atomic Energy Commission, an advisory body to the prime minister.

Representatives from China, Indonesia, Malaysia, the Philippines, South Korea, Thailand, and Japan are participating in the two-day meeting.

Oshima said Japan, which has so far helped nuclear power cooperation mainly through exchanges of nuclear specialists, intends to promote cooperation further to ensure effective use of the region's limited resources.

The Japan Atomic Industrial Forum, a trade group affiliated to the Ministry of International Trade and Industry, has sent missions to the participating countries over the past two years to sound out ways of how Japan can apply its technology and financial assistance in the field of atomic energy, conference officials said.

In Monday morning's session, Djali Ahimsa, director general of Indonesia's Atomic Energy Agency, spoke of the present status of nuclear energy development in his country, and Chen Zhaobo, vice president of the China National Nuclear Industry Corporation, spoke about China's future nuclear energy plans.

Ahimsa confirmed that Indonesia has asked for Japanese Official Development Assistance (ODA) to conduct a feasibility study on the site for a planned nuclear power plant in Java.

Indonesia, however, has also asked the United States and France to assist with the feasibility study and has not yet decided which country will carry it out, Ahimsa said. Government officials said that while Japan cannot provide ODA for building a nuclear plant abroad, the aid can be used for feasibility studies.

Chen said China is steadily building nuclear power plants by its own efforts and is actively applying radioisotope and radiation technology in the industrial, agricultural, and medical fields.

Conference Closes in Tokyo

*OW1303225190 Tokyo KYODO in English 1341 GMT
13 Mar 90*

[Text] Tokyo, March 13 (KYODO)—A gathering of senior Asian atomic energy officials closed a two-day session Tuesday with a pledge to hold the conference annually and explore regional cooperation for the development of safe uses for nuclear power officials said.

In the first international conference for nuclear cooperation in Asia, Japan suggested the region jointly develop experimental atomic reactors. Japan also proposed cooperation in the development of radiation techniques to reduce damage to agricultural products and to cure uterine cancer, which is common in women in the region, officials said.

Participants from China, South Korea, Indonesia, Malaysia, the Philippines, Thailand, and Japan called for the training of safety specialists who can help insure the safety of nuclear power, the officials said. Many nations urged regional cooperation to promote public acceptance of nuclear power citing growing criticism following the Chernobyl Nuclear Power Plant accident in the Soviet Union in 1986, they said.

The group agreed the first step toward regional cooperation programs should include such things as financial burden-sharing and coordination of goals, they added. Japan will face the task of securing financial support, including governmental official development assistance (ODA), officials of the Science and Technology Agency said.

On Monday, participating nations lectured on the status of nuclear energy development in their countries. The conference was sponsored by Japan's Atomic Energy Commission, advisory body to the prime minister.

The Japan Atomic Industrial Forum, a trade group affiliated with the Ministry of International Trade and Industry, has sought ways Japan could contribute technology and financial assistance to the field of atomic energy and has sent missions to the participating nations during the past two years.

The next meeting, expected by March 1991, has not been set officials said.

HUNGARY

Paks Nuclear Waste Dump Construction Barred

*90EC0341Z Budapest NEPSZABADSAG in Hungarian
3 Feb 90 p 15*

[MTI report: "Minister Bars Nuclear Waste Dump"]

[Text] There will be no nuclear waste dump in Ofalu for the time being, because the minister of social welfare and health has rejected the Paks Nuclear Power Plant Enterprise's appeal.

In his decision issued on 5 June 1989, the state chief inspector of health and epidemiology already denied the nuclear power plant's application for a permit to build the waste dump. The plant's director general appealed to the Council of Ministers to review the decision, but now the minister concerned has upheld the chief inspector's earlier decision.

It will be remembered that, in conjunction with the proposed nuclear waste dump in Ofalu, intense professional

debate flared up over, among other things, the wells, springs and streams close to the intended site. One of the main objections raised by a body of independent experts opposed to the project on professional grounds was that wells and springs were located closer to the site than what the pertinent standard allows. Namely, according to the standard, a permanent nuclear waste dump must be located at least 500 meters from wells, springs and streams. In its reasoning the minister's decision points out that as long as this standard remains in force, a variance must be obtained before a building permit can be issued. The Paks Nuclear Power Plant Enterprise did not obtain a variance, because it had accepted as authoritative a report prepared by an ad hoc committee of the Hungarian Academy of Sciences. The report found that the wording of the standard's provisions regarding wells, springs and streams was superficial, and that the distance restrictions should apply only to sources of drinking water. But the findings of a committee of the Academy of Sciences cannot rescind a standard; only the government organ that issued the standard originally has the authority to rescind it.

BRAZIL**CNEN Chief Nazareth Replaced by Luiz Santana**

PY2503195190 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 23 Mar 90 p 11

[Report by Tania Malheiros]

[Excerpts] Rio de Janeiro—Physicist Rex Nazareth, 52, one of the top mentors in the Brazilian parallel nuclear program, was replaced yesterday as head of the National Commission for Nuclear Energy (CNEN). He will be replaced by physicist Jose Luiz Santana, brother-in-law of Federal Deputy Prisco Viana of the Brazilian Democratic Mobilization Party (PMDB). Santana has served as the secretary general of the Ministry of Housing and Urban Development, in the Office for the Financing of Studies and Projects (Finep), in the Institute of Radio-Protection [Radioprotecao] and Dosimetry (IRD), and in the CNEN, which he left four years ago because of incompatibility with Rex Nazareth. [passage omitted]

Santana is not known in the scientific community and his positions in the parallel nuclear program and the Angra I and Angra II nuclear power plants are not known. "I hope that the CNEN will continue to display its capabilities for the benefit of Brazilian society and will never allow the country to become dependent on other nations," Nazareth said.

Progress of Nuclear Submarine Project Surveyed

90WP0050A Rio de Janeiro MANCHETE in Portuguese 27 Jan 90 pp 58-65

[Text] At the Rio de Janeiro Navy Shipyard, the first two submarines to be built in this country—from a West German design—are taking definite shape. But Brazil wants more: sailing far away from dependence on others, it has completed the first submarine design of its own. The Navy's director of naval engineering, Admiral Elcio Freitas, has brought the mystery to the surface, taken the project from the package of documents stamped "secret," "confidential," and "reserved," and shown the design of the submarine exclusively to MANCHETE. A periscope in the colors of the Brazilian flag is visible in Brazil's waters.

Brazil now has its first independently produced submarine construction design and is thereby preparing to join the extremely restricted "submarine builders club," whose members now include only the superpowers—the United States and the Soviet Union—and the European military powers: Great Britain, the FRG, and France. The project has been revealed exclusively to MANCHETE, the first magazine to gain access to a section of the Rio de Janeiro Navy Shipyard that is surrounded by every possible security measure and mechanism: the Submarine Shop. But the shipyard will not be entering unknown waters when it builds the first Brazilian-designed submarine, since it is already building two IKL-209's, both based on a West German

design—meaning that the acquisition of technology is assured. The "father" of the first design for the construction of a Brazilian submarine—known as the NAC-1—is the Navy's director of naval engineering, Admiral Elcio Freitas. Because it can travel far below the surface, the submarine is viewed as a warship constituting an almost unattainable target. When nuclear powered, it can travel faster than surface vessels.

The Brazilian design is the starting point—or count-down—toward giving the country its own design for a nuclear-powered submarine by the end of this decade. As a step in that direction, the first Brazilian nuclear-pulsation reactor has already entered the production phase in Ipero, 20 kilometers from Sorocaba in Sao Paulo State. The most complicated item in this plan has already been taken care of: guaranteed mastery of the technology for enriching uranium, a strategic mineral of which Brazil possesses reserves totaling 300,000 metric tons.

The NAC-1 submarine designed by Brazilian civilian and military marine engineers will have an endurance of 60 days, or more than the IKL-209 (which can remain at sea for 50 days). The Navy has one IKL-209 that was built in the FRG and is building two more, both based on designs by West German engineers.

The NAC-1 will be 67 meters long and 15 meters high, with a pressure hull 8 meters in diameter. With a submerged displacement of 2,425 metric tons, it will have an operating depth of 300 meters and carry a 39-man crew. It will cost the equivalent of \$200 million. It will represent a significant advance in military and civilian marine engineering and in the training of engineers and workers. A group of those experts has already undergone a training period in the FRG and is now monitoring construction of the two submarines at the Rio de Janeiro Navy Shipyard.

Claiming that his statement could be checked by experts if necessary, Adm Elcio Freitas said that the NAC-1 project, in which engineers from the Federal Universities of Rio de Janeiro and Sao Paulo are participating, would benefit various segments of civilian industry. And he observed: "It is not a project—or rather, an investment—of purely military or, from a wider perspective, strategic value, but rather one that is much more significant to Brazilian society." He pointed out that most of the experts working on the project were civilians and that there were civilians supervising military men in the directorate.

Advanced stages of the project are now beginning to be reached. By the second half of this year, purchase orders may be issued to civilian firms, among them Nuclep [Nuclebras Heavy Equipment, Inc.], which is responsible for building the submarine's hull. With the NAC-1, Brazil is reaching the final stage in shipbuilding (since it has already designed corvettes) by freeing itself of dependence on others.

In the military strategic sphere, as in the scientific sphere, the most important thing is not doing something but knowing how to do it. One need only look at the situation in pharmaceuticals. Brazil manufactures innumerable products, but must pay royalties. It is from that dependence that the computer industry is still trying to escape, as is the space industry.

Vocational training in the shipbuilding industry means advancement for the worker, who will receive better pay, more food, and appropriate medical care. Worker Claudenir Pinto Dias of the Navy Shipyard says he feels like an astronaut when he wears special clothing (one purpose of which is to provide him with pure oxygen) to shot blast (with particles of steel) components of the IKL-209. That technique is used to prevent the equipment from oxidizing in the marine environment.

The head of the Submarine Shop, Commander Nairo de Abreu, inspects the conditions under which the workers do their jobs: "Here we have to combine efficiency with care for human life. It is not enough to prevent accidents; we must also prevent the damage that can be done if certain procedures are not followed." For some welding work, the workers protect their eyes, since their eyeballs could be damaged.

How can a country with a foreign debt of \$120 billion and an acute social crisis, public deficit, and so on start building submarines? Admiral Armando Vidigal, who has been participating in international meetings where he advocates economic cooperation among the Latin American countries, says: "A country like Brazil must have external security compatible with its rights from the economic point of view. It is a mistake to think that armed forces exist to make war. They are necessary to ensure peace. Lebanon is a country that did not prepare for its defense, and today it is a setting for conflicts and is partially occupied by Syria. Christians and Muslims lived there for a long time without war. Now Syria is exploiting the problem between Christians and Muslims. A country cannot give up its means of defense just because it is neutral."

Adm Vidigar recalls the "lobster war"—the diplomatic conflict between France and Brazil—that occurred during the Goulart administration, when French fishermen were catching lobsters in Brazil's territorial waters. "When Brazil banned lobster fishing, the French sent their Navy to support their fishing boats. Brazil sent its fleet to the Northeast, and France backed down." The admiral, a respected strategist, admits that France did not really retreat because of Brazilian military power, but because of the damage to French prestige that would occur if it persisted in disregarding a sovereign decision by the Brazilian Government.

The strategy behind construction of the Brazilian submarine is that of discussion—that is, the ability to discourage any attempt to disregard our sovereignty, because there are times when international policy is

based not on ethics but on a country's interests, immediate or otherwise. The military say that in such a climate, he who does not defend himself is sunk. Without even being a submarine.

Country To Have Access to CERN Research

90WP0056B Sao Paulo O ESTADO DE SAO PAULO
in Portuguese 22 Feb 90 p 16

[Article by Flavio Cut]

[Text] Rio de Janeiro—This week Brazil formally joined the restricted club of countries possessing advanced technology in subatomic physics research. The agreement was signed by the National Council for Scientific and Technological Development (CNPQ) and the European Council for Nuclear Research (CERN) in Geneva, Switzerland. Under the agreement, our country will now have access to the latest results obtained in the fields of subatomic physics and astrophysics. Carlo Rubbia, a director of CERN and winner of the 1984 Nobel Prize in Physics, said yesterday at the Federal University of Rio de Janeiro (UFRJ): "Brazil is a country with a great tradition in scientific research, and it is joining the project with guaranteed access to the most advanced aspects of particle research."

CERN is regarded as the world's largest and most important research laboratory in the field of physics. It brings together scientists from various countries who jointly study the results of the atomic acceleration of particles in the world's largest accelerator (which has a circumference of 27 kilometers). "The particle accelerator is one of the best tools for research, and it represents one of the ways in which Brazil can adapt to the new level of scientific research," Carlo Rubbia said. Brazil began cooperating with CERN through Portugal in 1988, when scientists from the Coordination Board of Postgraduate Programs in Engineering (COPPE) at the UFRJ began working at the institute's headquarters in Geneva. "I hope that the Brazilian crisis will not affect our agreement," said Rubbia jokingly, and he went on to point out that CERN's objective is research and that ideas are the chief form of cooperation among the member countries. "The firms that invest in CERN get a four-to-one return on their investment. For every Swiss franc invested, those firms get back 4 as a result of the technology developed there," said Rubbia.

The Nobel prizewinner in physics says that although the CERN accelerator was built for one-tenth the cost of the U.S. accelerator (which is still in the design stage), it will make it possible to confirm the existence of the last elementary particles remaining to be detected. "I don't think we should continue to compare equipment solely on the grounds of competition. What is at stake is the search for a basic answer to nature," he explained.

Scientists Comment on Soviet Cooperation Proposal

90WP0042B Sao Paulo O ESTADO DE SAO PAULO
in Portuguese 3 Feb 90 p 5

[Text] The proposal for nuclear cooperation between Brazil and the Soviet Union, made by the USSR Academy of Sciences to President-elect Fernando Collor, will have the effect of giving Brazil access to a technology that until now it has been developing only on a small scale and for research purposes. The University of Sao Paulo (USP) is the only Brazilian organization studying nuclear fusion, in connection with which it is developing a small thermonuclear reactor. Under the terms of the new agreement Brazilians will be able to take part in the pioneer project developed by the scientists of the USSR, the United States, and countries of the European Economic Community.

News of the agreement was viewed with misgivings by the Brazilian scientists. Physicist Ennio Candotti, president of the SBPC [Brazilian Society for the Advancement of Science], declared that he personally did not assign a high priority to the project for cooperation with the Soviet Union to develop a thermonuclear reactor. In Candotti's opinion it would be more advantageous for Brazil to initiate agreements in other areas such as computer science and space technology.

Physicist Luiz Pinguelli Rosa, a member of the Brazilian Physics Association [SBF] committee for monitoring nuclear matters, said that announcement of the cooperation was "one more marketing ploy." Pinguelli declared that nuclear fusion—which would be developed by the reactor—has so far been used in the world only for the manufacture of thermonuclear bombs. "There are no guarantees," he said, "that the effort expended to build the reactor would give rise to technology for use in the production of energy."

In Candotti's opinion, major projects such as this "are customarily announced in the grand manner and immediately thereafter are forgotten." Pinguelli commented that he took part in an international conference in Rio two years ago during which it became clear that the nuclear fusion research carried out in Japan, in the United States, and in the Soviet Union itself still does not provide any assurances of the success of this technology.

CTA To Inaugurate Linear Accelerator

90WP0042A Sao Paulo O ESTADO DE SAO PAULO
in Portuguese 3 Feb 90 p 14

[Article by Flavio Nery: "Accelerator Makes It Easier for Brazil To Make the Bomb"]

[Text] Sao Jose dos Campos—The Aerospace Technology Center (CTA) has just taken another step toward mastery of nuclear technology. Next Wednesday the linear accelerator of electrons will be inaugurated at a ceremony to be attended by President Jose Sarney, eight Cabinet ministers, a number of senators and deputies, and Rex Nazare, chairman of the National Commission for Nuclear Energy. It is the first equipment for the production of high-energy neutrons that uses Brazilian technology.

Construction of the accelerator has provided Brazilian technical experts with the know-how needed to execute projects for the construction of large-scale nuclear installations, thereby ensuring mastery of a sector that is of strategic importance in the acquisition of nuclear technology. The accelerator is the one step that was lacking for completion of the national program of reactor development.

According to the official program, the presidential party will land at the CTA airport at 0950 hours and then proceed to the Institute for Advanced Studies, located on the Tamoios Highway, which runs from Sao Jose dos Campos to the northern coast of the state of Sao Paulo.

At the Institute a group of 600 specialists—one of the most competent groups of scientists on the continent—is working on high-tech programs, one of which will give Brazil in the near future the capability to make a political decision to build nuclear weapons. Other scientists are preparing components for space vehicles and also for conventional missiles such as gyroscopes, lasers, and high-performance microprocessors. All of this is based at one of the continent's largest computer centers, the central unit of which is located on an underground floor of the main building.

Only a few people have access to the CTA Institute for Advanced Studies. The building—which resembles a hexagon—will be visited for the first time by journalists this Wednesday. To enter the building one must know a code that has to be typed on the alphanumeric keyboard and also have identification that is checked by the memory of the equipment. The Institute is also protected by sensors and an internal TV circuit with strategically located cameras.

Despite this paraphernalia, in February 1986 six men carried off the safe from the Bank of Brazil's office in the building without firing a shot. It was payday for the employees, and the robbers took 7 billion cruzeiros (the cruzeiro was the monetary unit at that time). Although the target was a safe, the robbers could have been interested in obtaining documents with secret information worth a lot more money than that.

INDIA

Rocket Engine 'Successfully Ground Tested'

*BK2303093290 Delhi Domestic Service in English
0435 GMT 23 Mar 90*

[Text] The second-stage rocket engine test of the Polar Satellite Launch Vehicle, PSLV, has been successfully ground tested. The test was conducted at the liquid propulsion space center at Mahendra Giri near Nagercoil in Tamil Nadu. A senior official of the space center told PTI that the test lasted for about two minutes. He described the event as another important milestone in the Indian space research.

BJP Chairman Advocates Indian Nuclear Bomb

*51500083 Madras THE HINDU in English
22 Feb 90 p 7*

[Text] Ahmedabad, 21 Feb (PTI)—The BJP leader, Mr. Atal Behari Vajpayee, today welcomed the prime minister, Mr. V.P. Singh's statement that India would have to review its nuclear policy if Pakistan employed its nuclear power for military use.

At a press conference here, Mr. Vajpayee said the government should take up the matter with the United States which had refused to pressure Pakistan from going nuclear because of the Soviet presence in Afghanistan.

Now that the Soviet Union has withdrawn its men from Afghanistan, the U.S. Administration should warn Pakistan clearly of stoppage of economic and military help if it continued to manufacture atomic weapons clandestinely, Mr. Vajpayee said.

The National Front government had successfully thwarted the attempts of Pakistan to mobilise world opinion against India on the Kashmir issue. The country was strong enough to give a fitting reply to an aggressor as it had in the past, he said.

At a meeting in Bombay, Mr. Vajpayee urged the government to counter Pakistani interference in Jammu and Kashmir by "taking advantage of the unstable situation in Sind" if necessary and to make nuclear bombs as a "deterrent" to Pakistan's bomb programme.

"Kashmir has become a weapon for the Pakistani Premier, Ms. Benazir Bhutto, to whip up support for her leadership as she is faced with grave internal instability," he said.

NC-Cong.(I) Blamed

The National Conference-Congress(I) coalition government was to blame for the Kashmir situation that had been deteriorating for the last three years, Mr. Vajpayee said. The Congress(I) was "thwarting" a move for an all-party resolution in Parliament to proclaim that Jammu and Kashmir was an integral part of India, he alleged.

"The nation must not be partitioned again," he said and called for abrogation of special status to Jammu and Kashmir to "break the wall between the State and the rest of India."

NC Demand

In a politically significant move, the National Conference today demanded that the Centre open a dialogue with the Jammu and Kashmir Liberation Front (JKLF) and other militant organisations and "restore" the autonomy enjoyed by Jammu and Kashmir prior to 1952.

The demand was made by Prof. Saifuddin Soz, leader of the parliamentary party of National Conference. "Leaders of all political hues should be involved in the dialogue," Prof. Soz told reporters in New Delhi.

Defense Appointments Said Not Linked To Nuclear Option

*51500084 Madras THE HINDU in English
9 Feb 90 p 9*

[Text] Tirunelveli, 8 Feb—The Chairman of the Atomic Energy Commission, Dr. P.K. Iyengar, has clarified that the appointment of Dr. Raja Ramanna, a former chief of the AEC as a Minister of State for Defence and himself (Dr. Iyengar) as the Chairman of AEC did not indicate that the country was considering the nuclear option.

Speaking to THE HINDU at Kanyakumari on Thursday after a visit to the proposed site of the Soviet-aided nuclear power plant at Koodangulam in Tirunelveli district, Dr. Iyengar said the preliminary steps to fill up the post of the chief of the AEC were initiated much earlier as certain procedural formalities had to be complied with. His appointment was not like that of Dr. Raja Ramanna who was made the Minister of State for Defence overnight after consulting him.

It was sheer coincidence that both the appointments came within a week, he said in response to a question whether their appointments hinted any review of the country's nuclear option, because both were connected closely with the Pokharan nuclear device explosion in the early seventies.

To a question as to whether the country could manufacture a nuclear bomb, he said if needed and warranted India would produce a nuclear device. "But we would not like to do it because it would lead to proliferation."

Asked further whether the country could manufacture a nuclear bomb quickly in view of the fact that there had been no nuclear tests after Pokharan Dr. Iyengar said: "Obviously we can do it in the very short time."

Referring to the Koodangulam project, he said the proposed site close to the sea was an excellent location for a nuclear power station. The fallout of the project would not be radiation, but economic benefits to the community, he said. The core area of the nuclear plant would

occupy lesser space than a cement plant and there was no danger of any atmospheric pollution and the greenery would not be spoiled, he said.

V. P. Singh Says India To Keep Nuclear Options Open

51500087A Bombay *THE TIMES OF INDIA*
in English 21 Feb 90 p 1

[Excerpt] Rajkot, Feb. 20—The Prime Minister, Mr. V. P. Singh, today said that there would be a radical change in the security environment if Pakistan went nuclear.

Talking to reporters before starting his day-long election tour of Saurashtra and Ahmedabad, Mr. Singh said: "If Pakistan does go nuclear, we will have to review our policy and there would be a radical change in the security environment."

Mr. Singh said India's nuclear policy was clear that it should be for peaceful purposes only and we would adhere to it. However, if Pakistan opted for nuclear bombs, the entire security picture would change. "We hope Pakistan will desist from going nuclear," he added.

Replying to the charges of the former Prime Minister, Mr. Rajiv Gandhi, that the Union home minister, Mufti Mohammed Sayeed, had links with the terrorists in Jammu and Kashmir, Mr. Singh said: "It is totally false. Mufti is a staunch nationalist and a patriotic public servant."

Denying another charge of Mr. Rajiv Gandhi that he (Mr. Singh) was opposed to the Narmada project and had advocated against the project before the Lok Sabha elections, Mr. Singh said he had made his stand clear publicly. "My stand is firm and clear. The Narmada project is going to be completed on schedule."

Asked when the BJP would join the National Front ministry headed by him, the Prime Minister said that, according to the present stand, the communist parties and the BJP would support the government from outside. When told that the BJP general secretary, Mr. Kishan Lal Sharma, had announced that the BJP might join the government, Mr. Singh said: "What I have been informed is that the BJP has decided to support the government from outside."

Mr. Singh, who is also the Janata Dal president, said he would quit one of the offices after the assembly elections. He said: "I have told my partymen that they should make me either the prime minister or the president of the party." The choice should be left to him now.

Mr. Singh said there was no compromise on the policies and programmes of the Janata Dal while admitting Congressmen into the party. It was for the state units to decide on the admissions (of Congressmen). Intervening, Mr. Chimanbhai Patel, the Gujarat Janata Dal president, claimed that only those Congressmen who had accepted the ideology and programmes of the Janata Dal had been admitted.

Mr. Singh, who came here by a regular commercial flight of the Indian Airlines, was delayed by 30 minutes. He was immediately taken to the airport building for an urgent talk with the Union home minister, Mufti Mohammed Sayyed [as published], who had earlier made a call to Rajkot. [passage omitted]

France Told of Concern Over Nuclear Sale to Pakistan

51500088A Madras *THE HINDU* in English
24 Feb 90 p 1

[Article by K. K. Katyal]

[Text] New Delhi, Feb. 23—India has conveyed its concern to France over the latter's offer of a nuclear power plant to Pakistan. This was because anything which could strengthen or expand the weapons-oriented nuclear programme was a cause of worry to New Delhi, as the official spokesman put it.

French President Mr. Francois Mitterrand's offer was no surprise, considering the elaborate homework done by the two countries for his just-concluded visit to Islamabad, but India's concern is not any less on this count.

In doing so, France obviously chose to ignore India's viewpoint that the factors, prompting Paris to cancel the supply of a nuclear reprocessing plant to Pakistan, 12 years ago, continued to operate even now. In 1978, France unilaterally cancelled the supply of a plant two years after signing the deal in view of Pakistan's nuclear ambitions. Pakistan is now either at the nuclear threshold or, as some believe, has already a small stockpile of nuclear weapons. The French decision, thus, seems inexplicable in this context.

Rocard's Defence

It is a well-considered, conscious decision taken after detailed discussions by the representatives of the two Governments in the two capitals. (However, the French Prime Minister, Mr. Michel Rocard, did not go to Islamabad for this purpose, contrary to what was reported earlier.) The issue did figure during Mr. Rocard's talks with Indian leaders during his visit here last month. Responding to their expressions of unease, he defended his Government's plan, saying that it was prompted by a desire to buttress the fragile democracy in Pakistan and that it should not be construed as directed against India.

France has now accepted Pakistan's undertaking to use the nuclear energy for peaceful purposes—in agriculture, industry and medicine—and makes much of the point that the supply would be subject to international regulations, controls and guarantees that go with the export of nuclear plants and materials.

U.S. Misgivings

This has not carried conviction with India—not even with the U.S. which, according to reports from Washington, has not made secret of its doubts. The U.S., it was stated, would closely monitor Pakistan's nuclear programme. It implicitly accepted that mere assurances were not enough since, as India often pointed out, Pakistan's programme was conducted in utmost secrecy and that its professions of using nuclear energy for peaceful purposes had not been on all fours with its actions.

The French decision, Washington fears, would spur a nuclear race in the subcontinent as India might be tempted to use the nuclear option, even though it has, after the 1974 test, stuck to its word and has not switched over to weapons technology.

New Warmth in Relations

Mr. Mitterrand's visit to Islamabad meant a new warmth in French-Pakistani relations. Last month, however, Pakistan expressed concern over France's move to reopen its Embassy in Kabul and wanted it deferred to "an appropriate time", but the advice was not accepted. Around the same time, the French authorities were upset by the evidence of links between Muslim fundamentalists, responsible for demonstrations and acts of lawlessness in Paris, with some groups in Pakistan. Two Paris newspapers wrote about the increasing Pakistani involvement with the Muslim fundamentalist groups in France and went to the extent of charging the Pakistan Embassy with involvement in activities, tending to patronise Muslim fundamentalists.

IRAQ

Italian Role in Missile Project Denied

*AU3103152390 Rome ANSA in English 0812 GMT
31 Mar 90*

[Text] (ANSA) Rome [no date as received]—Iraq denied receiving financing from Italy or any other source for the nation's plan to develop an intermediate range missile, named the Condor Project.

The Iraqi ambassador to Rome, Muhammad Sa'id al-Sahhaf, said Friday: "We have never received any economic or financial assistance from Italy or anyone else for financing the so-called Condor Project."

In his statement to the Italian news agency ANSA, the diplomat was responding to reports that a part of the unauthorized export credits extended to Iraq by the Atlanta, Georgia, branch of Italy's Banca Nazionale del Lavoro had helped finance the Baghdad government's missile program.

The ambassador went on to say that British, American, and Israeli charges that Iraq had attempted to smuggle in American-made nuclear weapons triggering devices was

"a hoax and a provocation. Moreover, Iraq has signed the nuclear nonproliferation treaty and is prepared to accept any verification," Al-Sahhaf added.

With reference to the intermediate range Condor 2, said by British secret service sources to be intended as the launch vehicle for a future Iraqi nuclear warhead, the ambassador denied that his country is cooperating with Argentina on this project. "Iraq does not need this missile in that others with superior performances are already in production," he said.

"Speaking of Italian financing for the Condor signifies carrying out a campaign for damaging relations between Italy and Iraq, and this is the real objective of the provocation mounted by the Israelis with the British," said Al-Sahhaf.

He insisted that Italian-Iraqi relations are good and the two countries are seeking to broaden them.

Scud Missiles Said Deployed on Jordanian Border

*JN3103145890 Jerusalem Television Service in Arabic
1630 GMT 30 Mar 90*

[Text] THE WASHINGTON TIMES says Iraq has deployed Scud-D surface-to-surface missiles on the border with Jordan, and that these missiles could hit targets in Israel and elsewhere. The paper adds these missiles could be equipped with nuclear warheads or chemical weapons.

Speaking to our correspondent for political affairs, Shlomo Ganor, Israeli sources confirmed this report, and said the foiling this week of the Iraqi attempt to smuggle trigger devices for nuclear bombs is considered decisive proof of Iraq's intention to produce nuclear weapons. The sources also noted U.S. President George Bush's statements and his concern over the danger of nuclear proliferation in the Middle East and the threat to which friendly states might be exposed.

Official Reactions to Nuclear Smuggling Charges

'Allegations' Denied

*JN2903090290 Baghdad INA in Arabic 0835 GMT
29 Mar 90*

[Text] Baghdad, 29 Mar (INA)—A Foreign Ministry spokesman has categorically, chapter and verse, denied allegations contained in a statement by the British authorities yesterday. In a statement to INA, the spokesman expressed Iraq's indignation over the apprehension of an Iraqi employee working legitimately at the Iraqi Airways office in Britain. The spokesman held the British authorities responsible for the consequences of its measures. The spokesman stressed that Iraq reserves the right to take measures on the basis of reciprocal treatment. The spokesman said the allegations and measures fall within the tendentious campaign of slander that British authorities and media and Zionist circles have been launching against Iraq for some time with a

view to endangering Iraq's security and preparing politically and through the media for an aggression against the country.

Paris Envoy Interviewed

*JN2903184090 Paris Radio Monte Carlo in Arabic
1710 GMT 29 Mar 90*

[Telephone interview with Iraqi Ambassador to France 'Abd al-Razzaq al-Hashimi by George Dakkash—live]

[Text] [Dakkash] Your Excellency, my first question is the following: Iraq now stands accused, and as we have noticed, there is a hue and cry in some capitals as well as some anxiety over Iraq's ambitions to possess nuclear weapons. What do you have to say to this clamor, and is Iraq actually seeking to obtain this type of nuclear trigger device and other nuclear equipment?

[Al-Hashimi] What is taking place now is a continuation of the campaign that started with the Bazoft case. Everybody knows that this campaign ended when the soundness of Iraq's position was confirmed, because Iraq had exercised its right to defend its safety and security. We now have this campaign of another type. The United Kingdom, the United States, and everybody else know that Iraq has signed and ratified the agreement on the nonproliferation of nuclear weapons. They also know that Iraq's nuclear program is subject to supervision by the International Atomic Energy Agency in Vienna. Everybody also knows that the Iraqi nuclear program is for peaceful purposes in accordance with international laws that govern this type of activity. Also, in all its trade dealings with every country with which it has trade relations, Iraq has not violated any law of international trade, whether in the past, or at present. From this, we come to the conclusion that these are false and groundless accusations.

[Dakkash] Does this mean that Your Excellency rebuts the veracity of the reports from the United Kingdom that five persons, who were in the process of smuggling nuclear trigger devices, or equipment to Iraq, were arrested?

[Al-Hashimi] The truth is that the operation has taken place in a theatrical manner, and its objective is very clear. Its objective is to tarnish and harm Iraq's image. There is a contradiction in the reports. Notice that in the first hours, they screened pictures of equipment on television. A few hours later, they came back and said that these are not of the equipment, but that they were fake [preceding word in English]; that they have been replaced....

[Dakkash, interrupting] Imitation equipment?

[Al-Hashimi] Yes, they have been imitated. There is also the question of the Iraqi person whom they said they would deport from the United Kingdom, when they later discovered that this person holds a British passport. Had it been true that they have been following the affair for

the past 18 months, would they not know such a thing? Therefore, the operation is a continuation of the operation of distortion and the attempt to harm Iraq, its victories, and its honorable stands on national and Arab causes.

[Dakkash] In your opinion, is this the only objective, that of tarnishing Iraq's image, or are there other objectives?

[Al-Hashimi] The most serious thing now with respect to all that is taking place is the reaction to this drama that began to surface in the Zionist entity and in its media today and yesterday. If what is taking place in London—in terms of tarnishing Iraq's reputation and portraying the issue in this manner—is a justification, or an attempt to find the necessary justifications or atmosphere for a new Israeli military aggression against Iraq similar to the one it carried out on the Tammuz reactor in 1981, Israel and its allies must realize that Iraq in 1990 is not the Iraq of 1981. Iraq will not remain idle in the face of any attempt that will endanger its security, sovereignty, independence, or the safety of its people.

[Dakkash] Mr. Ambassador, thank you.

Military Industry Official Comments

*JN2903204290 Baghdad INA in Arabic 1940 GMT
29 Mar 90*

[Text] Baghdad, 29 Mar (INA)—An official source in the Ministry of Industry and Military Industrialization has rebutted the claims made in the statement issued by the British authorities yesterday, stressing that the claims and measures are part of the suspect and tendentious campaign waged by the British and Zionist circles against Iraq.

In a statement to INA, the source explained that the nuclear trigger devices the British authorities claimed to have discovered at the airport in London are no more than multipurpose electrical (?gauges) used in the fields of industry, scientific research, engineering, and electrooptics for [word indistinct] rapid electrical discharge from a [word indistinct] plasma.

The source said that a contract was drawn up in the proper way with a supplier in the UK for the purchase of electrical (?gauges) through an exchange of letters by ordinary telex [words indistinct] and the abidance by the export measures in the country of origin [words indistinct] the beneficiary party issued a statement of the final beneficiary.

The sources added that it is easy to link the ordinary use of any highly sophisticated electromechanical device with its use for military purposes.

Concluding his statement to INA, the source said that Iraq has not violated any law of any other country, emphasizing that Iraq has the full right to transfer technology, as is the case for the other countries in the world.

UK, U.S. Criticized

JN0204153090 Baghdad INA in English 1245 GMT
2 Apr 90

[Text] Baghdad, Apr 2, INA—An Iraqi foreign ministry spokesman today charged the British authorities of once more cooperating with American authorities in launching a suspicious drive of falsifications with the object of distorting Iraq's reputation and providing justifications for aggression on it. In a statement here today, the spokesman said that with this campaign a direct and clear service was made for the Zionist designs for aggression on Iraq and the Arab nation. The spokesman added that we preferred to wait for few days until all chapters of this suspicious campaign in the American and British mass media were disclosed so that the Arab and world public opinion become aware of all facts.

The spokesman said that this fabricated campaign originated from nothing more than a small and normal contract between an Iraqi establishment and a British trade company for securing materials for the uses of the Iraqi technological university for pure scientific purposes. The contract valued only 10,500 dollars.

The spokesman added that American authorities in cooperation with the British ones, as admitted by the said quarters, slipped on purpose an agent from the F.B.I. In the American company that supply those materials under the pretext of being director of the purchases to make this small and normal deal a suspicious intelligence matter and with the object of fabricating an accusation to the aim that Iraq endeavoured to acquire equipment for nuclear use from the American market. The spokesman further said that Iraqi concerned quarters did not deal with those attempts and objected them because the Iraqi authorities originally were desiring to acquire materials for scientific uses.

He further added that what confirms the pre-meditated and ill-intention of the design were the open correspondences addressed by the F.B.I agent who assumed the position of purchases director in the American supplying company to Iraqi quarters and in which he offered, not in response to Iraqi quarters, the selling of materials for nuclear uses in an open method that undoubtedly meant an involvement.

He further pointed out that everybody is aware that all telephone and telex contacts between the United States and abroad were subject to a continued and advanced electronic scrutiny from the American National Security Agency. The spokesman questioned how could a purchases director at an American company offer equipment for nuclear uses through an open telex unless the matter was originally designed and planned by American security circles?

The spokesman added that American and British authorities directed the operation through statements issued in a manner of accusing Iraq.... This accusation should be

addressed to the authorities themselves for their planning to hatch this design of involvement and for disreputing Iraq. The spokesman added that realities linked with this operation could not be isolated from the continued an organized slanderous campaign which is after harming Iraq's reputation and paving the way for an aggression on it and on its industrial and scientific establishments.

He further said that it could not be also isolated from the case of the spy Bazoft and the suspicious and feverish fabricated campaign instigated by British information and official quarters and the Western and American information quarters inspired by Zionism.

The spokesman added that objective of this campaign was after besieging Iraq and banning it with all means from carrying on its natural right in scientific progress and acquiring technology and consequently carrying out an aggression on it.... Iraq is not only the target but rather the entire Arab nation. The spokesman further said that design of Zionist and imperialist circles was after keeping the Israeli superiority on the entire Arabs and the final result was perpetuation of the Israeli occupation of the Arab land and the Israeli Western hegemony on the region and also liquidating rights of the Palestinian Arab people and their just cause.

The spokesman further said that Iraq had behaved legitimately in its resolve for obtaining technological and scientific progress in accordance with the international law and norms of dealing among countries and within the frame of a good-intentioned and aware policy.

The spokesman recalled that Iraq was one of the parties of the Treaty of Non-Proliferation of Nuclear Weapons (MPT) [as received] and was committed to it adding that the Atomic Energy Agency makes regular visits to Iraqi installations. On the contrary, Israel did not sign this treaty, and rejects signing it despite repeated resolutions of the United Nations and others calling for that. The spokesman further said that all reports including the American and Western ones confirm that Israel possesses nuclear weapons without instigating any row on it from those who are shedding tears on the security in the region... and like the furore aroused against Iraq on an affair planned by them.

The spokesman stressed that Iraq and the Arab nation would not submit to the continued attempts of pressure and blackmail and would continue its natural right for progress.... Iraq is fully aware of the relationship between these suspicious information drives and attempts with designs aiming at hatching up an aggression on it. The spokesman added that Iraq is fully vigilant of these attempts and those who are planning aggression should understand that Iraq has the will and possesses the means that enable it to retaliate on aggression and teach the aggressors a telling lesson.

An explanation attached to the statement of the foreign ministry spokesman said that in response to the need of the technological university in Baghdad for supplying

the laser energy system (CO₂), the Ministry of Industry contacted various companies for supplying it with high voltage capacitors for their use in this system. An offer by the British company Euromac was accepted in May 1989 for obtaining 85 capacitors at a total cost of 10,500 dollar. These capacitors are of multi-industrial and scientific uses in addition to the claimed possibility of using them as triggers and the certificate of the beneficiary party confirmed that use of these capacitors were for the laser system CO₂.

The explanation stressed that Iraq did not violate any contract or regulations as concern the export of prohibited commodities or materials and it has met all its obligations by signing the final user certificate and providing the supplier with all technical information.

It added that it was clear when reviewing cables of the American supplier company CSI that American official authorities were on purpose carried out an attempt that was aborted by the Iraqi side for placing it in an illegal position. [sentence as received] The explanation cited a telex by CSI American company on having a meeting with Iraqi specialists in London where the specialists stressed the specifications of the required materials and that Mr Saunders, who assumed the capacity of purchases director of the company and "entrusted by the (FBI)" insisted during the meeting on asking about the need of other materials like triggers used for nuclear explosion equipment.

The explanation quoted a telex by Saunders as saying "I personally may offer in addition to the CSI capacitors, my offer still stands as before, but I do agree with the president of CSI that our protection and safety from exposure to US authorities is our concern."

The explanation said that the Iraqi side was astonished over contents of the telex and expressed its protest to the supplier by a telephone contact. It added that when CSI company did not receive any reply from the Iraqi side and knew that its attempt was neglected it sent another cable on 22nd last January and was related to the question of the capacitors as included in the request. But the company referred that cable to an offer of other (equipment) with a warning of being discovered by American authorities.

Trigger Devices for 'Laser Technology'

JN0204160890 Baghdad INA in English 1420 GMT
2 Apr 90

[Text] Baghdad, Apr 2, INA—Iraqi Foreign Undersecretary Mr. Nizar Hamdun on Sunday [1 April] denied that his government was producing nuclear weapons and said Baghdad intended to use U.S.-made high-voltage capacitors confiscated in Britain for laser technology.

"My government was not involved in getting any detonators the way they are suggesting," Mr. Hamdun told the CBS television network in reference to a British-led

anti-Iraq propaganda campaign alleging that Iraq has smuggled U.S.-manufactured nuclear triggers via Britain.

"Iraq was interested in getting the high-velocity rubber high-voltage capacitors which have many applications in laser and other industrial fields," REUTER quoted Mr. Hamdun as telling the CBS. "We were not involved in any nuclear weapon discussion: My government's position is that Iraq has neither the capability nor the wish to produce nuclear weapons."

Mr. Hamdun denied allegations that the high-velocity detonators made to specifications requested by Iraq could be used only in atomic bombs but acknowledged they could be used for launching missiles. He said Iraq was interested in a comprehensive arms treaty in the Middle East that would cover long-range missiles and nuclear weapons. "But we don't like to be dealt with selectively on this or that weapon because we think all mass destruction weapons should be eliminated," he said.

Former assistant secretary of state Richard Murphy said Washington should look "very carefully" at Iraq's interest in a comprehensive arms agreement. "I think we need to devote more energy to that," he said.

Iraq's Osiraq [Tammuz] peaceful nuclear reactor was destroyed in a 1981 Israeli air raid. Hamdun warned Iraq would retaliate for any such recurring attack. "Iraq would always have the right to retaliate... We have I think the right to do that under international law," he said.

In a related development, Iraq's Ministry of Industry stressed that the alleged nuclear weapon triggers which British authorities claimed to have seized at London's Heathrow Airport were no more than electric condensers of the kind used in industry and scientific research. A ministry spokesman was quoted by Kuwaiti daily AL-QABAS International in its Saturday issue as saying that Iraq had signed a contract to purchase electric condensers from a British firm. The contract was signed with the British firm through proper channels, the spokesman said. He said Iraq has the right to the transfer of technology as is the case with all other countries.

The Kuwaiti daily said that a long-term and carefully-planned anti-Iraq campaign has been hatched to pave for an aggression against Iraq similar to Israel's raid on Iraq's peaceful nuclear reactor in June 1981. The daily referred in particular to articles written by a British journalist identified as Alan George in various British and European papers. In his articles George inserts allegations about Iraqi military industry and about foreign firms with which Iraq deals.

Al-QABAS international said that the British Foreign Office had summoned the Iraqi ambassador in London to enquire about an article alleging Iraqi-Argentine cooperation to manufacture Condor missiles. Al-QABAS

quoted sources in London as saying the anti-Iraq campaign was aimed at intimidating foreign firms and making them refrain from dealing with Iraq.

The British journalist had focused in his recent articles on Belgian S.R.C. firm and its president Dr. Gerard Paul, who AL-QABAS said, had been accused of cooperating with Iraqi military industry. Dr. Paul was recently assassinated just outside his home, but the British media chose to ignore the incident and imposed a blackout on the murder so as not to be linked with the articles written by Alan George, said AL-QABAS.

AL-QABAS added that the London-based MIDDLE EAST magazine published an article on Iraqi military industry, with a lot of fabrication about Iraqi missile industry and foreign firms allegedly cooperating with Iraq, AL-QABAS noted that the British magazine did not mention a source for its story. AL-QABAS said that if the information published by the MIDDLE EAST had been true it would have taken a whole "intelligence unit" to piece together. The paper added that the British Government was using the same method in official line in dealing with Iraq. "The British-fabricated story on nuclear weapon triggers confiscated at Heathrow Airport is naive. The devices seized were no more than electric condensers which are used in industrial and research fields," the paper said.

Ministry Condemns 'Slander'

JN0304212290 Baghdad INA in Arabic 1850 GMT
3 Apr 90

[Text] Baghdad, 3 Apr (INA)—An official source in the Ministry of Industry and Military Industrialization has stated the recent campaign of slander and distortion against Iraq contained fabricated statements and seeks to divert attention from the true nature of the electric capacitors that were contracted for. The campaign seeks to portray them as krytron triggers, which can be possibly used for nuclear purposes. He added such devices never were part of the order, nor have they been mentioned in any correspondence or any followup by us to implement the contract.

Commenting on this campaign of slander, the source told INA the technical specifications of the capacitors are completely different from those of the krytrons. The source added the electric capacitors differ completely from the krytron trigger in shape, volume, weight, use, and performance. They also differ in terms of the number of electric poles, the interior design, and the basic functions each of them performs.

The source explained the radioisotopes [al-mushi'at] are used for storing electric charges and have two poles. They are of the type the U.S. CSI company produces for laser systems.

The source added: As for the krytron trigger, it is a four-pole electrical valve in a glass container used to

produce electrical discharges in record time. This calls for passing an instantaneous high voltage current through the electric circuit.

Commenting on a detailed article in the British OBSERVER last Sunday [1 April] on the matter, published under the title "The Krytron Conspiracy," the source said nowhere in the article did the British paper refer to the order for capacitors, so as to make public opinion believe they would be used for nuclear purposes and to harm and slander Iraq.

ISRAEL

Rabin Comments on Iraqi Weapons

TA0304050790 Jerusalem Domestic Service in Hebrew
1605 GMT 2 Apr 90

[Telephone interview with former Defense Minister Yitzhaq Rabin by Hayim Zissowitz—live]

[Text] [Zissowitz] Good evening, former Defense Minister Yitzhaq Rabin.

[Rabin] Good evening to you and our listeners.

[Zissowitz] Perhaps you can elucidate to us something about the timing of the Saddam Husayn speech or the fact that for the first time after the long war with Iran, he admits that he has chemical weapons.

[Rabin] First of all, it is a good thing that at times of internal dissension and infighting, we get a reminder of the true problems—certainly in the sphere of security—which are still pertinent and which apply to Israel and to all of us.

The timing of this speech has to do with various reports both in THE NEW YORK TIMES and other places that exposed the attempt to smuggle the triggers which the Iraqi president mentioned. His speech was arrogant and boastful, and in fact is a protest against the entire world, including the United States, Britain, and the Soviet Union. Naturally, it is first and foremost provocative to Israel. His remarks express fear of and concern with Israel's capability.

[Zissowitz] Saddam Husayn has already used chemical weapons.

[Rabin] At the same time I believe he wished to remind Israel in particular that 1990 is different from 1981. In 1981, when the Iraqi nuclear reactor near Baghdad was bombed, Iraq was embroiled in war against Iran and experienced great distress, lacking the long military arm of surface-to-surface missiles, advanced chemical weapons, or modern fighter bombers. At the same time, it is impossible to ignore the serious, conceited, and vain threat against Israel.

[Zissowitz] How do you assess Saddam's declaration that he does not need nuclear weapons because he has chemical weapons?

[Rabin] This is because he knows that he does not possess nuclear weapons at the moment, because he is trying to say, and emphasize, that the threat still prevails should Israel be the first to engage in an offensive—although I would not suggest that anyone take this information at face value and or as an exclusive source—and that he has an answer that is superior to the capability he manifested about three years ago when he launched approximately 200 surface-to-surface missiles against Tehran and other cities in Iran. In other words, he wants to show that he has more effective weapons. From Israel's standpoint, it would be wrong to underestimate these threats. We should, nevertheless, bear in mind that we have the capability to provide a response far more lethal than Saddam Husayn's threats. I would advise him to refrain from provoking Israel.

Israel is strong and powerful, and Iraq is not outside the range from which Israel can deal it a serious blow. Therefore, this should be taken into account. At the same time, it should be known that we have the appropriate answer to these threats and that Saddam Husayn would be well advised not to provoke Israel.

[Zissowitz] Knesset Member Yitzhaq Rabin, what is the national assessment of Iraq's ability to attack the civilian population? He mentioned half of Israel's population.

[Rabin] I think this is nonsense. I am not ruling out the possibility that he has the ability to launch surface-to-surface missiles from Iraq toward Israel. Anyone capable of launching such missiles at Tehran is likewise capable of launching them against Israel from Iraqi territory. This is nothing new. We have known about this capability for a number of years now. The defense establishment and the Israel Defense Forces are prepared for such a possibility. I can envision no danger that Iraq would deal such a severe blow as Saddam Husayn boasts; certainly the Israeli reaction would be far more lethal than what he brags he could do to Israel.

[Zissowitz] Are we prepared for the possibility that the civilian population might be attacked?

[Rabin] As is well known, for nearly every civilian individual in Israel, we have a personal survival kit to protect that individual against chemical weapons. The equipment is stored in depots all over the country. When I was defense minister, we saw no need to distribute these kits to everyone, although in the past year we tried to distribute them to individuals in certain regions to study the individual's, or the family's, ability to store these items. The results of the study, based on that experience, will be reviewed and implemented.

I am not ignoring this danger, but I believe that our defensive capability can prevent a serious event.

[Zissowitz] Knesset member Yitzhaq Rabin, former defense minister, thank you very much.

[Rabin] Thank you.

Iraqi Chemical and Nuclear Threat Examined

*TA0304112990 Tel Aviv YEDI'OT AHARONOT
in Hebrew 3 Apr 90 pp 1, 12*

[Commentary by Ron Ben-Yishay: "One Ought To Believe Him"]

[Text] One ought to believe Saddam Husayn and take him seriously. He is no al-Qadhafi. His speech yesterday leaves no doubt that in a future conflagration with Israel, Iraq will try to attack Israel's civilian population with toxic gases.

To that end, the Iraqi Army will resort to its long-range surface-to-surface missiles and modern jet fighters. When it comes to acquiring missiles and chemical weapons, as well as when it comes to using them, Husayn has more than made good on all his threats. Over the last few years not only Iran, but also Israel and the United States, occasionally were surprised by the development pace and achievements of Iraq's military industries, which are based on foreign experts and on foreign knowhow that either was bought or smuggled into the country.

Husayn also created a surprise yesterday when he revealed he has binary gas; namely, a lethal gas made up of "innocent" materials which are stored separately. The fusion of these materials into a lethal gas is done in the bomb or the missile warhead after they have been launched toward their targets.

The effect of this gas on its casualties is similar to the known effects of nerve and mustard gas. The difference is the binary system enables the storage of large quantities of chemical warfare materials without risking their "getting old" or endangering the people handling them. So far, only the United States, and apparently also the Soviet Union, have been known to have the binary capability to produce war gas. Just like Husayn said in his speech, Iraq would now seem to be placing itself on the same level as the superpowers in the sphere of chemical warfare. What distinguishes him from the superpowers is that while they are divesting their chemical weapons and trying to ban their use through international legislation, Husayn continues to acquire these weapons with the intention of using.

This is the bad news.

The good news is Iraq does not yet possess the capability to manufacture a nuclear bomb. The Iraqi ruler admitted as much, and we also ought to believe him about this. He also was right in his argument that the British and the Americans had overblown the affair of the smuggled triggers in the media. The capacitors the Iraqis tried to smuggle out of the United States via London did not contain the krytrons, the tiny devices which turn these capacitors into detonators of nuclear bombs. The Iraqis only have been talking about buying them but, according to sources in Washington, they have not yet bought them.

Knowing that, Saddam Husayn apparently fears the brouhaha over the capacitors was intentionally blown out of proportion by the media to create an international climate of hostility toward his country, a climate which may pave the way for an Israeli preemptive strike on Iraq's missile sites and arms industries.

This may have been the reason for his high-strung speech and the unbridled threats contained in it. Just like any other tyrant, Saddam Husayn is paranoid and has good reason to feel persecuted. He more than once in the past has threatened to attack Israel if the latter strikes at his missiles and arms industries, but he never before has been so explicit.

At the moment, the Israeli response to Husayn's threats is based on two-tiered deterrence: a threat to carry out a preemptive strike or a "counterstrike" in the event Iraq uses its chemical weapons, and "passive defense", as well as improving and drilling civilian defense measures. There are means to intercept these binary missiles, such as the U.S.-made Patriot missiles, but Israel has not yet bought or leased them. Husayn's speech may not only advance the negotiations between the United States and Israel on the purchase of these sophisticated anti-aircraft missiles, but also accelerate the joint development of the Arrow missile by Israel and the United States.

The Iraqi ruler's speech will no doubt help the pro-Israeli lobby on Capitol Hill to fight off the administration's intentions to cut aid to Israel.

Reaction, Reportage on Ofeq 2 Satellite Launch

Launched 3 Apr

TA0304125890 Tel Aviv IDF Radio in Hebrew
1238 GMT 3 Apr 90

[Text] The Ofeq 2 satellite was launched into space a short while ago. Our Army affairs correspondent 'Amos Har'el has just arrived in the studio with the details:

We merely have the initial details. Ofeq 2 was launched into space from a launching site in central Israel at precisely 1500 [1200 GMT]. We cannot divulge the precise location of the launching. Our correspondent, present at the event, says he observed a red ball of fire shooting into the sky; it could be seen for approximately 30 seconds, after which it gradually disappeared.

We now are waiting for the official—and more detailed—announcement by the Israel Aircraft Industries. We only will note that this is the more advanced model of Ofeq 1, which was launched in September 1988.

Shamir Comments

TA0304141290 Jerusalem Domestic Service in Hebrew
1351 GMT 3 Apr 90

[Text] Here is a communique issued by the prime minister on the launching of Ofeq 2, which I have just received fresh from the oven, so to speak, from the prime minister's media adviser:

The impressive achievement of the Ofeq 2 launch executed today by the State of Israel, Prime Minister Shamir says, once again places Israel in the scientific and technological forefront with other countries in the world. It reinforces our country's capability and potential, he says. Our strength and abilities depend on initiative, scientific capability, and the ability to execute missions as manifested in the launching of the second Israeli satellite. Mr. Shamir dispatched congratulations and a message of well done to the teams responsible for this achievement, and hailed the contribution of the scientific community and the technological industries led by the Israel Aircraft Industries, who all chipped in to bring honor to the State of Israel. So much for the prime minister's statement.

Space Agency Head Interviewed

TA0304145690 Tel Aviv Educational Television
in Hebrew 1400 GMT 3 Apr 90

[Interview in studio with Professor Yuval Ne'eman, head of the Israel Space Agency, by Ilana Dayan—live]

[Text] [Dayan] We have heard that some two hours ago, Ofeq 2, Israel's second satellite, was launched into space. We were informed the launch was successful. One of those who imparted the news was Professor Yuval Ne'eman, chairman of the Israel Space Agency, who is here in the studio with us. Good evening, Prof. Ne'eman.

[Ne'eman] Good evening.

[Dayan] Is it possible to establish at this stage that the satellite entered its orbit and the launch was successful?

[Ne'eman] Yes, it already has performed about one and a half orbits around the earth. Everything went as planned: First, there was Ofeq 1, after which we said we would launch Ofeq 2 within about one year. It has taken us 18 months to launch it.

[Dayan] Was it a natural sequel or an entirely different model?

[Ne'eman] No, no, it was a natural sequel. This satellite is similar to the first one.

[Dayan] In what ways is it more advanced?

[Ne'eman] Its makeup includes lessons learned from the first, such as its upgraded protection against temperature changes, for instance.

[Dayan] Was it introduced because of faults discovered in the first model?

[Ne'eman] No, we simply learned how to do things a little bit better. After we learned what the problems were, we introduced improvements. In this context, the Israel Aircraft Industries [IAI] made a very nice effort. I can also say improvements have been made in the gyroscope, and a more advanced computer was installed. It can be said this satellite is not deaf, so to speak. The last one could send signals, but could not receive ours. This satellite can receive our signals and report reception.

[Dayan] TIME magazine reported about a year ago that Ofeq 2 is equipped with a sophisticated electrooptical camera that will relay photographs of troop movements and missile batteries in the United States. [as heard]

[Ne'eman] This satellite has no cameras, no payload [last word in English], as they say in English. It carries no load charged with performing defined tasks. TIME said the same about our first satellite and probably will say the same about our third. I suggest we refrain from believing TIME on these matters.

This satellite will live as long as the former one did: about two months, perhaps somewhat more or less. It is not that we are incapable of maintaining a satellite in space for longer than two months, but doing so would be pointless since the satellite has no tasks and is carrying no functional load. We hope Ofeq 3 or perhaps Ofeq 4 indeed will carry a considerable scientific load. Two experiments now are being carried out—one by the Technion and the other by Tel Aviv University—that will be incorporated into either Ofeq 3 or 4. If we do launch Ofeq 4, we may want to leave it in space for some 10 years.

[Dayan] Do your remarks imply these satellites are not designed uniquely for meteorological purposes?

[Ne'eman] My remarks do not imply this, because the satellites are a response to scientific needs and help us to learn facts that will be implemented in our communications satellite. There has been talk about the Amos satellite, and the IAI and several companies affiliated with it are making progress on this project. There, too, the lessons learned from Ofeq will be implemented.

[Dayan] How soon can we expect Ofeq 3?

[Ne'eman] At about the tempo to which we have become accustomed.

[Dayan] Such as one year?

[Ne'eman] You said that. We will see. We will need sufficient time to introduce more improvements and more functions. As for the scientific satellite, we would like to launch it in 1992, which is International Space Year, as well as the 500th anniversary of the discovery of America. We would like the State of Israel to mark that year with our scientific satellite.

[Dayan] Are you, like Minister Arens, unwilling to note a connection between the launching of Ofeq 2 and the recent reports about Iraq's nuclear potential?

[Ne'eman] Certainly. Like him, I see no connection between the two.

[Dayan] Was it planned for today?

[Ne'eman] We could not have planned Saddam Husayn's speech a year ago, when we decided on the approximate time of the launch.

[Dayan] Thank you very much, Prof. Yuval Ne'eman, and good luck.

Official Communique Issued

*TA0304153690 Jerusalem Domestic Service in Hebrew
1500 GMT 3 Apr 90*

[Excerpts] Here is an official communique on the launching of Ofeq 2. The Israel Aircraft Industries [IAI] says the launch was successful. The new satellite weighs 160 kg and is identical in shape to its predecessor, Ofeq 1.

Our correspondent Karmela Menashe reports the objectives of the current experiment were to prove capability in two-way communication with the satellite, including receipt of commands from an earth control station and remote control. Additionally, operational capability and resistance to atmospheric conditions in the subsystems intended for the next Israeli satellites also are to be tested.

The dimensions of the new satellite, Ofeq 2, are: diameter of the lower base, 120 cm; diameter of the upper base, 70 cm; and height, 230 cm. [passage omitted]

Foreign Minister Moshe Arens says the launching of Ofeq 2 is proof of Israel's technological superiority, but the timing of the launch is unrelated to Iraq's chemical capability.

Further on Technical Details

*TA0404050490 Jerusalem Domestic Service in English
0400 GMT 4 Apr 90*

[Text] Ofeq 2 has an elliptical orbit of between 210 and 1,500 km. Alan Ben-'Ami asked the coordinator of Israel's Space Agency, Professor 'Aqiva Bar-Nun, what the differences are between Ofeq 2 and the first satellite Israel launched into space 18 months ago.

[Begin recording] [Bar-Nun] A rather small difference if one looks at it globally, I would say. We, namely the Israeli Aircraft Industries, improved thermo protection, protection against cosmic rays, they use somewhat different gyroscopes to measure the angle and the rotation of the satellite, somewhat new computer with larger memory, new magnetometer—or improved at least. Another important feature is that whereas with Ofeq 1 we could only receive data from it, now we can also communicate with it, send to it signals. Not that it can do much with them, but at least we want to establish that we can talk to our satellite, as well as hear it.

[Ben-'Ami] Ofeq 1 was in space for something like four months. What's the life span, or the hoped for life span, of Ofeq 2?

[Bar-Nun] We expect it to be somewhat shorter, because at its closest point to the earth—I mean it goes between, say 210 km to about 2,000 km—and at the closest point it is lower than Ofeq 1, thereby the friction of the air—of the atmosphere—although it's rather dilute up there, still there is enough to slow it down and cause it to fall and burn earlier than Ofeq 1.

[Ben-'Ami] And after Ofeq 2, is Ofeq 3 already being planned?

[Bar-Nun] One has to plan things. We do plan a scientific satellite for 1992 on which we are supposed to put one telescope for X rays and one telescope for ultra-violet light, both of which are attenuated in the earth's atmosphere so we cannot observe any astrophysical objects from below. One has to go up there, and we are working on it now. [end recording]

Systems Said 'Fully Functional'

TA0404112890 Jerusalem Domestic Service in Hebrew
1005 GMT 4 Apr 90

[Text] All of Ofeq 2's systems are fully functional, and Israel Aircraft Industries [IAI] is very pleased. The satellite already has circled the earth 15 times. Our Army affairs correspondent Karmela Menashe reports:

[Begin recording] [Menashe] Ofeq 2 completes a full orbit around earth every 90 minutes. The satellite is fully operational, and we are pleased, says Dr. Moshe Bar-Lev of IAI administration:

[Bar-Lev] Since its launch, it has passed over Israel approximately 15 times, although we received signals of only some of them, naturally, in the land station on IAI premises. The next time it is scheduled to pass Israel is in about 10 minutes. The satellite is about 10 minutes away from us, orbiting at a distance of approximately 3,000 km from us. So far, all the satellite's systems are operating as they should, and we are very pleased. Everything has gone better than we expected.

[Menashe] This means you receive signals from it.

[Bar-Lev] Certainly. Each time it passes over us, we contact it, and it responds. We shake hands, to use a popular phrase, each time it traverses Israel.

[Menashe] Dr. Bar-Lev, how long do you think Ofeq 2 will spend in space?

[Bar-Lev] At the time of the launch, the intention was to leave it in space somewhere between 40 and 60 days. We now must update the orbit data, but it seems to us this will be its life span.

[Menashe] Ofeq 1, launched in September 1988, spent four months in space—contrary to your expectations.

[Bar-Lev] So maybe this is an opportunity to correct the error. Our premise at that time, as we stated, was that the active life span of Ofeq 1 was planned to be one month. Its longevity in orbit was to have been—and actually was—four months. One does not make mistakes in such instances.

What happened then was we took the worst scenario into consideration: What happens if it should reach a state of electrical distress, in which case it will cease to function, but will continue to encircle the earth in its orbit. The minimum life span at that time was one month.

[Menashe] So Ofeq 2 is not in distress.

[Bar-Lev] Ofeq 2 is not in distress; its life span is slightly shorter than that of Ofeq 1, but this is intentional. [end recording]

Shows 'Israel's Long Arm'

TA0404101090 Tel Aviv HA'ARETZ in Hebrew
4 Apr 90 p A1

[Commentary by Ze'ev Schiff: "Still Not Really a Military Satellite"]

[Text] Even if the date for the launch of Israel's second satellite, Ofeq 2, was decided on some time ago and was in no way connected to the Iraqi president's threatening declarations that his country has chemical warfare and that he would set half of Israel on fire if it attacks Iraq's chemical plants, it now will be viewed as part of the Middle East arms race, which includes long-range surface-to-surface missiles carrying chemical and other warheads.

Until Ofeq 2's launch via a multi-stage rocket, international attention centered on the Iraqi president's threat to use chemical weapons against a civilian population, which was widely denounced. The launch into space of Israel's new satellite has extended the issue of the Middle East missile arms race and Israel's immediate response to Saddam Husayn's threat.

The rocket launch and the introduction of a new missile into orbit are usually not done from one day to the next. The action involves many complicated moves, including steps aimed at preventing surveillance of Israeli actions. The decision to launch Ofeq 2 was made known to some of the Cabinet ministers some two weeks ago. There are those who claim the launch should have been delayed for several more weeks to avoid any possible link with the Iraqi president's declaration.

Whatever the case, Israel once again has shown its technological and scientific capability. It also is an unequivocal reminder to Iraq and many other countries about Israel's long arm: but it also undoubtedly will spur on the other side to try to make sure it does not lag too much behind Israel. The Arabs, led by Iraq, will search for arms systems and ways to balance the Israeli deterrence and to try to confront it with an Arab deterrence.

Israel no longer is the sole player in the Middle East missile game. For years it has been striding ahead of all others, but some Arab countries, such as Iraq, are not ready to lag behind with folded arms. It should be assumed Israel still will have the edge for a long time, but it is a mistake to think missiles and satellites are the answer to all military and strategic problems that crop up in the Israel-Arab conflict.

Did Ofeq 2 shove Israel way ahead in the development of a military satellite which can provide photographs and transmit them in real time? Ofeq 2 can be guided from its land station. That is another—albeit small—step forward. But until the Israeli satellite carries a suitable camera, which has to be developed in Israel, it will not really be a military satellite.

Trial Launch of Arrow Missile Set for August

*TA1303122090 Tel Aviv HA'ARETZ in Hebrew
13 Mar 90 p A2*

[By Re'uvan Pedatzur]

[Excerpts] A first attempt to launch the Arrow antimissile missile, developed by Israel Aircraft Industries, is scheduled for August. It is as yet unclear whether, in its first trial launch, the Arrow will be tested against another missile, or whether the test will be just the launch itself and the missile's behavior in the air. If the decision is made to try it against another missile, a surface-to-surface Lance missile will be launched and the Arrow will be guided to hit it.

The planned launch will be carried out in the midst of the heated arguments in the U.S. Administration concerning the future of the Arrow project. This project is part of the U.S. Strategic Defense Initiative (Star Wars), and attempts recently were made by U.S. officials and Congressmen to narrow its extent, or even cancel it. [passage omitted]

If the trial launch proves successful, this will constitute a technological breakthrough. The Arrow is being developed with new operational concepts, and the missile has qualities attained by Israel Aircraft Industries experts using modern and advanced technologies. According to the plans, the Arrow will have extraordinary maneuverability, far better than all missiles existing today. [passage omitted]

PAKISTAN

Bhutto Reiterates 'Full Support' for Nuclear Power

*BK2903154790 Islamabad Domestic Service in Urdu
1500 GMT 29 Mar 90*

[Text] The prime minister has underscored the need for continued research in the field of nuclear energy and has called upon the Pakistan Atomic Energy Commission [PAEC] to redouble its efforts to implement its nuclear

power programs. She was addressing the annual PAEC meeting in Islamabad today. The prime minister, who presided over the meeting, gave assurances that the government will continue to give its full support to implementation of the peaceful nuclear program. She commended the work of PAEC scientists and engineers who are operating the Karachi Nuclear Power Plant with indigenously developed nuclear fuel.

The meeting reviewed last year's performance and expressed satisfaction and happiness with the successes achieved in connection with the establishment of nuclear power plants under recent agreements with China and France. The prime minister emphasized that the successes have been achieved without compromising Pakistan's nuclear energy policy.

Karachi Nuclear Plant Closed for Maintenance

*BK1603004690 Hong Kong AFP in English 1945 GMT
15 Mar 90*

[Text] Karachi, March 15 (AFP)—The Canadian-supplied Karachi nuclear power plant (Kanupp) has been shut down for repairs and maintenance, a spokesman of the Pakistan Atomic Energy Commission (PAEC) said here Thursday [15 March]. He said that the 137-megawatt plant had to be closed for "overhaul of the process saltwater pumps and for the rectification of a mechanical problem of the fueling machine". He said that "the fault cannot be termed an accident leading to the closure", adding, "it was normal replacement of machine parts which is a common thing with such a plant".

The plant will be operational soon after the rectification and maintenance works were completed, the official said, without specifying when. Sources here said it may take at least 15 days. Kanupp was also closed in April last year for more than six months following a leakage of an important quantity, some 35 tons, of heavy water caused by a defective valve. According to Kanupp officials, who tried to dispell the great sensation and apprehensions about the radiation effect, the leakage caused "no serious radiation."

The plant was put back into operation after the necessary repair by Pakistani engineers. Canada, which supplied the nuclear power plant in the early 1960s, discontinued all nuclear cooperation with Pakistan following a controversy over alleged Pakistani efforts at making a nuclear bomb. China and France have recently agreed to sell nuclear power plants to Pakistan to supplement its energy requirements.

Nuclear Plant Deal With France Viewed

Scientist: 'Deal A Major Step'

51004704 Karachi DAWN in English 25 Feb 90 p 10

[Text] Islamabad, Feb 24—The renowned nuclear scientist Dr. Abdul Qadeer Khan said on Saturday that

French agreement to supply Pakistan a 900 megawatt nuclear power reactor was a major breakthrough in the energy sector.

Replying to journalists' questions at a local function, he said "this is an achievement for which credit goes to Prime Minister Benazir Bhutto."

The chief of the Kahuta Research Laboratories said he was confident that the country would manufacture such reactor indigenously over a period of time. "We have the capability to do so," he remarked.

To a question, he said the nuclear reactor would require 200 to 250 tons of fuel for the first firing. This requirement, he added, can also be met indigenously.

Answering another question, he said the installation of the plant could be completed within a period of eight to ten years.

When his attention was drawn towards the American reaction to the proposed deal, Dr. Khan said "Pakistan nuclear programme is not weapon-oriented." The Bush administration, he added, had already certified Pakistan's intention of using nuclear technology for peaceful purpose, while sanctioning aid packages last year.—APP.

Commentary on Safeguards, U.S. Reaction

51004704 Karachi DAWN in English 28 Feb 90 p 5

[Article by M. H. Askari]

[Text] In a manner which instantly reminded one of late Charles de Gaulle's near-contempt for American attitude vis-a-vis France, President Mitterrand dismissed the U.S. State Department's concern over his decision to provide Pakistan with a nuclear power plant. Reports from Dhaka said he told a Press conference there: "If they (United States) want to protest, let them protest." It was de Gaulle who adopted a hauteur style in matters of foreign policy, and asked the Americans to remove the NATO bases from French soil. President de Gaulle made it clear that he would brook no American (or other outside) interference in the French Government's policies, despite heavy French dependence at the time on economic assistance from the United States.

President Mitterrand was equally equanimous about possible Indian reaction to the French-Pakistan deal on the nuclear power plant. Without undue concern for diplomatic niceties, he told an Indian journalist: "Of course, India would not be pleased; Pakistan also was not pleased when France sold a nuclear plant to India in 1982." Incidentally, that decision too was taken by President Mitterrand himself. Nonetheless, from his declarations on Pakistan's nuclear programme (and the Kashmir question) Mitterrand has made it plain that a lot of water has flowed under the bridges of the Seine

since 1977 when France, with President Giscard d'Estaing at the helm, decided to renege on the deal for a reprocessing plant negotiated by the late Zulfikar Ali Bhutto.

The nuclear reprocessing deal was a point of special prestige for Bhutto. Its cancellation, under unconcealed pressure from the Americans and other Western governments, was a major setback to his career, at a time when he was faced with unprecedented difficulties at home. It is important to recall that the proposed reprocessing plant was placed under what were regarded as iron-clad safeguards. It is often not realised that the agreement, under which France undertook to make the plant available to Pakistan, was jointly negotiated and concluded between three parties—Pakistan, France, and the International Atomic Energy Agency (IAEA). It specifically stipulated that the plant or its components would not be used for "the manufacture of any nuclear weapon or to further any other military purpose or for the manufacture of any other nuclear explosive device." The agreement also made it clear that any other reprocessing facility or specified equipment for reprocessing, "designed, constructed or operated on the basis of or by the use of relevant technological information transferred from France to Pakistan" would also be covered by the same stringent safeguards.

All the same, there is little doubt that Bhutto was more than once threatened that if he went ahead with the French deal, he would be overthrown and probably face far worse consequences. Ms. Shirin Tehir-Kheli, who was then teaching at Temple University in the United States and is now associated with the U.S. State Department, in an article published in the summer 1978 issue of ASIAN SURVEY, said that during her research on the French-Pakistan agreement, "one source told me that the outgoing American Ambassador in Islamabad had gone so far as to tell Bhutto bluntly that if he did not back down, he would no longer stay in power." Bhutto in his 'last testament' *If I Am Assassinated* also said that his cabinet colleague Rafi Raza had a four-and-a-half hour meeting with him in January 1977 and gave him the advice that if he went ahead with the reprocessing project, the Opposition would put his office and his life in peril. Raza suggested, out of personal concern for Bhutto, that the deal should be called off.

While the nuclear power plant is not the same thing as a reprocessing plant, it is obvious that President Mitterrand intends to make up for the injustice done to Pakistan by cancelling the deal signed with the Bhutto government in 1976. By his visit to Pakistan, Mitterrand has reaffirmed France's commitment to consolidation of the democratic process. By agreeing to provide the nuclear power plant, he has demonstrated his faith in Ms. Bhutto's undertaking that Pakistan's nuclear programme is entirely peaceful.

Significantly, after France backed out of the reprocessing plant deal under pressure, it obviously was not prepared to do business with Gen Zia-ul-Haq, who had deposed

Bhutto. The French authorities even turned down a proposal from the late General to make certain critical modifications in the plant process in order to make it less 'lethal'.

According to well-informed observers in Islamabad, President Mitterrand's ultimate decision to supply a nuclear power plant came as something of a surprise even though compensation for the loss incurred by Pakistan on account of the cancellation of the reprocessing plant deal was not unanticipated. It appears that the French negotiators had given no indication to their Pakistani counterpart that the request for a power plant would receive the President's approval. A private lunch hosted by the prime minister and Mr. Asif Zardari in honour of the French President and Madame Mitterrand, shortly before the press conference, apparently helped to clinch the deal.

The feeling that Mitterrand's predecessor, Giscard d'Estaing, had not been altogether fair to Pakistan may have had as much to do with the last minute decision as the present French president's personal regard for the Bhutto family. French intellectuals felt terribly disturbed when Mr. Bhutto was put on trial by Gen. Zia-ul-Haq and to this day the French press refers to his hanging, on the basis of a (split) judgment by the Supreme Court, as 'judicial murder'. French Socialists, which includes Mitterrand, always had a great deal of admiration for the Bhuttos in their struggle against the Martial Law regime.

It would be unrealistic to assume nonetheless that the deal negotiated for the supply of a power plant would have smooth sailing, although one would hope it would not lead to any horrendous consequences. The American concern has already been openly expressed and the U.S. Government would want to use this opportunity to bring Pakistan's entire nuclear programme under what they regard as full-scope safeguards. This would include installations such as the one at Kahuta, which Pakistan has developed through its own resources, without any foreign assistance. Indians, too, can be expected to step up their efforts to bring Pakistan under pressure. The French Embassy in Islamabad has already held a briefing to allay the misgivings arising from Mitterrand's announcement of the agreement with Pakistan.

Prime Minister Bhutto, at the joint press conference held at the end of President Mitterrand's visit, reiterated Pakistan's willingness to enter into a nondiscriminatory arrangement with India to guarantee nuclear nonproliferation in South Asia. She expressed her readiness to sign the NPT if India agreed to do the same. She also recalled that over the years Pakistan had made a number of proposals for bilateral, regional, or international arrangements to keep South Asia free of nuclear weapons.

Nevertheless, the renowned nuclear scientist, Dr. A.Q. Khan, has not made Ms. Bhutto's task any the easier by his claim that Pakistan has the necessary capability to produce a nuclear weapon. Reports from Islamabad

claim that talking to journalists on February 24, Dr. Khan said once again that Pakistan was already in a position to produce a nuclear weapon and that if the government took a policy decision in this direction, the same could be done. He also suggested that the French power plant would be based on indigenously produced enriched uranium. He estimated it would be eight to 10 years before the French plant would be installed. (Mr. Munir Ahmad Khan, chairman, Pakistan Atomic Energy Commission, in a TV interview a day later, however, maintained that the plant would be in place at the end of six years after a formal agreement had been concluded with the prospective French manufacturers.)

While there is no way to know whether the claims made by various Pakistani technocrats in regard to the nuclear programme are authorised by the government or not, the thought is inescapable that they often appear to be in competition with one another in the kind of claims that they make.

The immediate U.S. reaction to the French-Pakistan agreement was by no means agreeable. It is said that at the departure ceremonies for President Mitterrand at Islamabad airport, American Ambassador Oakley was conspicuous by his absence. Then came the statement by the U.S. State Department's spokesman expressing concern at the deal.

Going by the experience of the past, the U.S. attitude has the potential to impact not only on the future course of U.S.-Pakistan relations but also on developments within Pakistan. American economic and military assistance which has admittedly been generous since the Afghanistan crisis came into the open will cease if Pakistan is seen as developing some sort of nuclear capability. There also exists in Washington a fairly articulate lobby which continues to demand stricter American control over Pakistan's nuclear programme. U.S. legislative procedures make it incumbent upon the U.S. President to furnish a certificate of assurance each time the Congress is approached with a proposal for economic and military assistance for Pakistan. Because of the Soviet invasion of Afghanistan in December 1979, nuclear proliferation became a secondary consideration for American policymakers. By the same token, after the Soviet withdrawal, the U.S. Government can begin to take a more rigid position.

At the same time, the possibility that some American policymakers may not be averse to mobilising a lobby within Pakistan in the hope of bringing about a change in the present political configuration in the country cannot altogether be ruled out. As it is, Ms. Bhutto is faced with considerable opposition on the domestic front, and it may suit certain vested interests to see the boat rock even more violently.

It was not without significance that soon after President Mitterrand's visit, there were rumours, apparently emanating from foreign sources, that an assassination attempt had been made on the life of a top-ranking

Pakistani leader. Providentially, the rumours turned out to be totally without basis. While such bizarre happenings may seem altogether remote in Pakistan's context, insanity motivated by political ambition is not outside the realm of possibility.

Need for Nuclear Diplomacy in Subcontinent Stressed

51004703 Karachi DAWN in English 25 Feb 90 p 7

[Article by M. P. Bhandara: "N-diplomacy in Subcontinent"]

[Text] Nuclear weaponry in a superpower context has undergone three phases. In the first phase—the decade of the 1940's—the atom bomb was regarded as a piece of ordnance, as any other. It is possible to pinpoint this phase commencement to early 1940 when British expatriate scientists Otto Frisch and Rudolf Peierls determined the essential theory for an explosive chain reaction in uranium employing fast neutron fission of element U-235. This phase ended on Sept 27, 1949, when the Soviet Union ended the American monopoly of the atom bomb.

The high point of this decade was the construction of atom bombs and the use of the same over Hiroshima and Nagasaki in August 1945. The might of the atom was truly established. It was a weapon extraordinary in terms of immediate and permanent destruction. It was soon realised that a new theory of war—or nonwar—had to be evolved in a situation where rival powers possessed this weapon.

In the second phase, which may be said to commence from the 1950's extended till the mid 1980's. Nuclear weapons were no longer regarded as ordnance or weapons in the conventional sense but as deterrents of final resort. The new theory of deterrence developed in a superpower context postulated that a nuclear aggressor—or first user of nuclear weapons—surely had to receive equal or greater nuclear punishment in retaliation. A system of communications and government was built round this concept.

The deterrence theory developed slowly with the development of technology over the years; it coincided with the period of the Cold War between the Superpowers. Deterrence concepts were from time to time in competition to militarist theories which aimed at nuclear supremacy. The development of thermonuclear weapons (hydrogen bombs), intercontinental missiles (ICBMs), MIRV fitted (multiple targetted) nuclear submarines, cruise missiles, and a super market variety of short and intermediate range weapons with pinpointed delivery systems, are some of the technological break throughs of the Cold War period.

The last serious bid for nuclear supremacy is based on the militarisation of space—the so-called 'Star Wars' programme. Conceptually, this scheme is based on the deterrence theory. Satellites in space supposedly will

release antiballistic missiles to destroy attacking enemy ICBM's released from air, land, or sea based vehicles. These multi-trillion dollar schemes are presently on hold (i.e. confined to research only). The star wars scheme has come under intense criticism in the United States on technical and theoretical grounds. The main technical (and political) objection is that a hairline separates deterrence from offensive capability.

The third phase, in the development of a nuclear world is the current era. The dictum that "a nuclear war cannot be won and must never be fought" has finally seeped into the consciousness of major policy makers due to sheer economic, political, and moral pressure. People and public opinion particularly in the USSR, Western Europe, and the United States are reluctant to support the massive costs of nuclear armories and research. There are more mundane needs of the people in all countries that need be satisfied. The pursuance of military equivalence with the United States has virtually bankrupted the USSR which has a far smaller economic base than the United States.

Indeed, the United States itself has been running massive internal and external deficits for the past decade. Consequently, the fashionable theories of the 1970's such as MAD—mutually assured destruction—is giving way in the last few years to the most spectacular disarmament ever undertaken in history. Intermediate range ballistic missiles, by treaty between superpowers have been outlawed; actually dismantled and destroyed under mutual supervision. A host of proposals are presently on the superpower agenda for the drastic curtailment of all categories of nuclear weapons, delivery vehicles and deep cuts in land based forces of the Warsaw Pact and NATO.

The political corollary of this enormous movement has been the virtual elimination of superpower confrontation, political freedom for East Europe and yet unknown political consequences for the Soviet Union and beyond. Indeed, the ripples of this peace and liberty surge, are being felt universally. In southern Africa a sea change has come about in the attitudes of the white minority. In Cambodia and the Middle East, peace talks have been intensified. The eddies of this forgotten vale of Kashmir.

It is in this world context that we must have a fresh look at the political implications of the probable nuclearisation of the subcontinent in this last decade of this traumatic century.

Both Pakistan and India are ambiguous nuclear powers. What is known is that Pakistan has achieved uranium enrichment of a three percent and therefore in all likelihood has the technology to enrich uranium to weapons grade material i.e. over 90 percent. India has a large stock of unsafeguarded plutonium. Both countries have made remarkable progress of late in the development of missile systems. India has a proven edge over Pakistan in all nuclear fields and delivery systems excepting perhaps in uranium enrichment. Pakistan has little or no stocks

of unsafeguarded nuclear fuels and as far as it is known, no stocks of plutonium. India further has a solid lead in delivery systems having successfully tested Agni, an intermediate range ballistic missile.

The table given below is a speculative report compiled by the highly respected Carnegie Endowment for International Peace, a U.S. institute which closely monitors nuclear developments in the nuclear emerging countries.

The table speculates as to the number of nuclear weapons available in either country. We may insert a caveat in reading this table as both countries vociferously deny construction or possession of nuclear weapons. Indeed, a big technological step is involved in fabricating weapons from fissile materials. But, this step is perhaps no more complex than the manufacture of U-235 or reprocessing spent fuel rods in the manufacture of plutonium:

Speculative Estimate of Indian and Pakistani Nuclear Weapons Potential

	1991		1992	
	Low	High	Low	High
India				
(a) Plutonium available for weapons and cumulative number of weapons	432 kgs.	865 kgs.	508 kgs.	1019 kgs.
(b) Number of possible weapons	54	173	63	203
Pakistan				
(a) Cumulative amount of weapons grade uranium (WGU)	109 kgs.	302 kgs.	130 kgs.	365 kgs.
(b) Number of possible	4	20	5	24

Source: (L.S. Spector: *The Undeclared Bomb—Carnegie Endowment Book*).

The upshot of the above discussion leads to the inescapable conclusion that it is within the power of Pakistan and India to manufacture nuclear weapons and deliver the same. In the cold light of power politics it is not intentions or government policies that matter but capability; capability that will be harnessed in the final analysis to meet the security needs of either country.

Our previous analysis indicates that in the third stage of the nuclear epoch, war as a means of settling disputes is virtually obsolete between rival nuclear powers. If this assumption be true, will a mutual recognition of rival nuclear weapon capability in the subcontinent eliminate or substantially reduce the possibility of war? Or qualitatively improve relations between Pakistan and India?

Unfortunately, we must answer this question in the negative for the time being, for at least two reasons:

(1) The nuclear weapons capability of either side is not proven but speculative. It is only after Pakistan and India can convince one another that their worst perceptions of the other are true, will the constant threat of war give way to mutually respected deterrence—and hopefully, ultimately to peace.

Paradoxically, this leads us to the conclusion that both India and Pakistan have to be convinced of one another's nuclear weapon capability. But now? Both countries are committed to nuclear ambivalence which in plain language means to pursue nuclear objectives, to the best of each nation's ability, but to deny any development for non-peaceful purposes. In this regard one is reminded that India described the 1974 Pokharan atomic test as a "peaceful" explosion. By analogy the use of an atom bomb over Hiroshima and Nagasaki could be described as a "peaceful" end to World War II.

(2) Secondly, the civilian populations in either country have little or no idea of what a nuclear war means.

However, it may be gainsaid, that the perception in India of Pakistan's nuclear capability is likely to help Pakistan at the bargaining table; hitherto, being hopelessly outgunned in terms of conventional weaponry Pakistan had a poor bargaining hand. There is no way that Pakistan can ever reach a parity in conventional arms with India. For example, India with two blue water Navies is said to be six or seven times the size of the Pakistan Navy. In the algebra of nascent nuclear warfare numerical superiority of nuclear weapons is diminished. According to the above table (Speculative Report of the Carnegie Endowment) India may have 24 weapons—to our five—but even if we had one deployable weapon, India would think a 100 times before attacking Pakistan.

It goes without saying that in the context of the ancient rivalry between India and Pakistan, so long as Pakistan remains militarily vulnerable, the prospects of peace in the subcontinent remain dim. Pakistanis and Indians are no different to the Russians and Americans of yesteryear who are forced to seek peace through mutual accommodation—a nuclear war is simply unthinkable. Indeed, such may be the convoluted road to peace in the subcontinent.

Commentaries View U.S. Reaction to Nuclear Plant Deal

'Reality' of U.S. Friendship

90O10216A Karachi JANG in Urdu 24 Feb 90 p 3

[Editorial: "U.S. Reaction to Nuclear Plant Deal"]

[Text] The U.S. reaction to the French agreement to sell a 900 megawatt nuclear plant was not wholly unexpected, but it did once again expose the U.S. inclination

to deprive Pakistan of modern technology. The United States obviously wants to keep Pakistan weak under the guise of friendship. The United States feels that France did not impose appropriate restrictions on Pakistan in this deal. All France asked in this deal was that Pakistan submit to international inspection of this nuclear plant. Pakistan has accepted this demand as it badly wanted to buy this plant to overcome the dire shortage of energy and for industrial and agricultural development. Pakistan accepted this condition since it has a clear conscience and uses its atomic program for peaceful purposes only. This has been certified by the experts of international agencies after their visit to various Pakistani nuclear plants.

The U.S. State Department wanted France to require Pakistan to open up all its nuclear installations for international inspection. This would have helped implement the great U.S. goal to stop South Asia from making nuclear weapons. It is strange that Pakistan's neighbor, India, exploded an atomic bomb in 1974 and is busy making nuclear weapons as affirmed by international agencies, Israel has also made atomic bomb under U.S. supervision, and South Africa, which has the U.S. and other Western countries' support for its policies, has also become a nuclear power. The United States never thought it necessary to require these countries to have international inspections. It never complained about their nuclear preparations, either. Canada, the Soviet Union, the United States, and Israel have helped openly to make India a nuclear power. In addition to this, the United States, India, and other enemies of Pakistan have been complaining about the Kahuta Atomic Plant, which was installed by Pakistan's own engineers, scientists, and other experts. The United States and its associates do not want an Islamic country to end their monopoly in the nuclear area. This would make the nuclear capability available to other Islamic countries. We believe that the stand taken by our government spokesmen that Pakistan would not accept any pressure on this issue is perfectly correct. Pakistan is not worried about the Indian reaction either. The U.S. reaction is an attack on French autonomy. France had canceled the atomic reprocessing plant deal with Pakistan under U.S. pressure in 1976. The situation, however, is very different now. President Mitterand, the world-renowned statesman, is leading France now. The Government of Pakistan should not be apologetic, and should complete the deal with France immediately. We are requesting various opposition groups within the country to please support our government on this issue to cancel the U.S. reaction. This is not a political issue; it is the question of our nation's progress, safety, security, and pride. The United States had reacted similarly when Pakistan had agreed to buy a 300 megawatt nuclear plant from China last year. Our agreement with France has shown how friendly and supportive the United States is towards Pakistan! Our government and all political groups should use this as a yardstick to measure U.S. support and friendship for Pakistan. This would help us know friend from foe in the future.

U.S. Criticism Rebutted

90OI0216B Lahore NAWA-I-WAQT in Urdu 24 Feb 90
p 3

[Editorial: "U.S. Objections"]

[Text] The United States has strongly criticized the French agreement to supply Pakistan with a nuclear power plant. The United States objected that France has not included all the conditions required by the International Atomic Energy Commission in the agreement. This would have required Pakistan to open all its nuclear installations for inspection. The only condition France has is that Pakistan would keep the installations sold by France open for such inspections. The United States said that this would seriously jeopardize its efforts to restrict nuclear weapons in South Asia. The U.S. reaction was not unexpected. It had played an important role in the cancellation of the French reprocessing plant deal. The United States and other nuclear powers have established a kind of monopoly over nuclear technology and they do not want anyone outside of the Atomic Club to enter this arena. The worst part of this story is that there has been only one destructive use of the atomic bomb. This was done by the United States and not by an "irresponsible" Third World country. The United States has double standards. It does not oppose as strongly India, Israel, South Africa, or any non-Muslim country as it does oppose Pakistan, Iraq, Libya, or an Islamic country. The Iraqi nuclear installations were destroyed with the help of roguish Israeli Air Force. Israel and the United States have used its armed forces repeatedly to "teach a lesson" to Libya. India and Israel made many plans with the U.S. support against Pakistan. However, by the Grace of God and our alertness, the Kahuta Center is still safe. What is more, Pakistan is buying a nuclear power plant and not a reprocessing plant from France. The whole world knows how scarce energy is in Pakistan. We have been living with load shedding for many years. This energy crisis is hurting Pakistan's industry, trade, and agriculture. This is also causing havoc in our urban areas. Pakistan, of course, is capable of producing hydroelectricity. However, because of our government's support for some states, wrong planning, and internal strife, the 3,600 megawatt Kalabagh Dam project could not get off the ground even after 25 years. It should not have been very difficult to satisfy all the states during the last 25 or 30 years. There just were no efforts and this plan fell prey to evil intentions and WAPDA's [Water and Power Development Authority] inefficiency and laziness. No other plan to produce electric power was made due to the disputes over this plan. National strife and political confrontation have been the major hurdle in its path. Thus, Pakistan has no alternative but to use the thermal or the nuclear power route. There are possibilities to produce electricity with coal, but Sardar Farooq Laghari, minister for power and water supply in the new democratic government, has decided that thermal power is the most expensive alternative since it will depend on oil imports and its fluctuating price. Nuclear power is the only answer left for the world to meet its energy needs.

Whenever Pakistan started negotiations with any country on this issue, our "best supporter, friend, and benefactor," the United States, always stopped it. Now that Mitterand, the French president, recognizing Pakistan's needs has consented to supply a 900 megawatt nuclear power reactor, the United States is demonstrating its "friendship" again. President Mitterand should be praised for ignoring the U.S. objection. The Government of Pakistan has also shown courage by announcing that it would not accept the U.S. pressure. Pakistan has openly called the U.S. pressure unreasonable

and inappropriate. Pakistan's stand is based on facts and truth. As a country it has the right to look for resources necessary to meet its needs. The United States has never liked Pakistan. It declared it an important cornerstone of its foreign policy because of the Afghanistan crisis. The United States and its people become our enemies when it comes to providing light to the people or protecting the factories from load shedding. The United States likes to boast about its friendship with Pakistan. The Pakistani people should wonder, "if you are our friend, then the sky will be our enemy!"

20th Jubilee of Nonproliferation Pact Marked

PM2103120390 Moscow IZVESTIYA in Russian
19 Mar 90 Morning Edition p 3

["IZVESTIYA interview" with USSR Deputy Foreign Minister V.F. Petrovskiy: "For as Long as a Single Warhead Exists...."—first paragraph is IZVESTIYA introduction]

[Text] The Treaty on the Nonproliferation of Nuclear Weapons entered into force 20 years ago, in March 1970. Signed 1 July 1968 simultaneously in Moscow, Washington, and London by representatives of the USSR, the United States, and Britain, this document plays an important part in curbing the nuclear arms race. USSR Deputy Foreign Minister V.F. Petrovskiy talks about the treaty's significance in an interview for IZVESTIYA.

[Petrovskiy] The Treaty on the Nonproliferation of Nuclear Weapons is based on reciprocal commitments by states possessing nuclear weapons and by nonnuclear states. These commitments are intended to rule out the possibility of the acquisition of nuclear weapons by the latter—that is, to prevent so-called "horizontal" proliferation. According to Article I of the treaty, states possessing nuclear weapons pledge not to transfer to anyone nuclear weapons or other nuclear explosive devices and not to help nonnuclear states to manufacture or acquire them. In turn, states not possessing nuclear weapons pledged, in accordance with Article II, not to manufacture and not to acquire nuclear weapons or other nuclear explosive devices and not to seek or receive any assistance in their manufacture. Moreover, Article VII confirms the right of any group of states to conclude regional agreements in order to assure the total absence of nuclear weapons in their territories and to create nuclear-free zones.

The treaty also includes provisions on preventing the "vertical" proliferation of nuclear weapons, that is, their improvement by the nuclear states. In accordance with Article VI, each of the parties to the treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race and complete disarmament under strict international control.

The pledge by nonnuclear states to place under International Atomic Energy Agency [IAEA] control (safeguards) all the fissionable material used in all their peaceful nuclear activities, which is meant to prevent its diversion to military purposes, occupies an important place in the text. The parties to the treaty must also promote in every way the development of international cooperation in the application of nuclear energy for peaceful purposes.

[IZVESTIYA] How many states have so far endorsed the treaty, and what can you say about the effectiveness of its procedures?

[Petrovskiy] The Nuclear Weapons Nonproliferation Treaty is one of the "most densely populated" international agreements: 140 states are party to it, which gives it a high degree of authority worldwide. Unfortunately, the parties to the treaty do not include two nuclear powers—France and the PRC. However, it should be said that in many important respects they are behaving as if they were parties to the treaty.

India, Pakistan, Argentina, Brazil, and also Israel and South Africa remain outside the treaty. Their nonparticipation in the treaty undoubtedly causes certain problems, but, by and large, there is every justification for saying that the treaty and the procedures established on the basis of it are effective. Since the conclusion of the treaty the number of nuclear states has remained unchanged. Which means that the danger of the worldwide spread of nuclear weapons has been curbed and the treaty's main goal has been attained. Not for nothing did M.S. Gorbachev call the nonproliferation treaty a "unique example of states' highly developed sense of responsibility."

I want also to stress the IAEA's special contribution to ensuring the treaty's effectiveness. It is its system of safeguards that cements the nonproliferation setup and ensures its durability. Incidentally, the USSR is actively involved in the agency's inspection activities. This work is also being carried out on the territory of the Soviet Union: Some years ago, as an act of good faith, the USSR made part of its peaceful nuclear activities subject to IAEA safeguards. Agency inspectors are frequent visitors to our country.

[IZVESTIYA] The latest round of Soviet-U.S. consultations on nuclear weapons nonproliferation issues took place in Moscow in February. What were its results?

[Petrovskiy] The results of the Moscow round of consultations are bound to give rise to mutual satisfaction. Senior representatives of the USSR and the United States carried out a joint analysis of the status of the nuclear nonproliferation setup, exchanged opinions on the situation in certain parts of the world, and evaluated IAEA activities in relation to the treaty's goals and the effectiveness of the international principles of the regulation of nuclear materials export. Special attention was paid to preparations for the conference to examine the operation of the treaty, which is to meet in August-September this year. The depth and quality of the debate is indicated by the mere fact that three special working groups were set up within the framework of the consultations.

The exchange of opinions was frank and constructive. The result was that the sides recorded the closeness or full coincidence of their viewpoints on the issues under consideration. And the range of issues was rather wide. For example, during the consultations the sides touched on the state of affairs relating to the burial of radioactive waste and favored the more active application of the IAEA's mighty scientific and practical potential to the

solution of this problem, which is acquiring an increasingly definite social dimension.

To complete the picture, I would add that we conduct similar consultations annually with the third depositary, Britain, and also a number of other countries, in particular the FRG, Canada, Australia, and Switzerland...

[IZVESTIYA] How do you view the future of the Nuclear Weapons Nonproliferation Treaty?

[Petrovskiy] The answer to this question will depend to a large extent on the results of the aforementioned conference to consider the operation of the treaty, which takes place at the end of the summer. That is why so much attention during the Soviet-U.S. consultations was devoted to preparations for the conference.

The assessment of the treaty's effectiveness by many states, both states that have endorsed it and states that have not endorsed it, is formed by specifically taking into consideration the actual advances that are being made in the disarmament sphere, in particular as a result of the Soviet-U.S. talks in this field. Obviously, the success of the upcoming conference largely depends on what substantive and concrete accords have been reached at these talks by the time it opens, above all on questions of nuclear tests and strategic nuclear arms limitation. Therefore, progress at the talks on nuclear disarmament is, as it were, a material condition of the conference's adoption of far-reaching decisions in support of the Nuclear Weapons Nonproliferation Treaty and the international setup that has taken shape on the basis of it.

The Soviet Union favors making the Nuclear Weapons Nonproliferation Treaty universal and of indefinite duration. We hold that the document should remain in force for as long as there remains a single nuclear weapon in the world. It can only be replaced by an all-embracing international agreement not to revive nuclear weapons once they have been fully and finally eliminated.

1957 Ural Accident Radioactivity Problem Viewed LD2803175490

[Editorial Report] Moscow Domestic Service in Russian at 1030 GMT on 28 March carries a 10-minute interview by Andrey Nikiforov of Aleksandr Nikolayevich Penyagin, a member of the USSR Supreme Soviet's Ecology Committee. Nikiforov says that Penyagin has recently returned from the Ukraine, Belorussia, and the RSFSR [Russian Soviet Federated Socialist Republic] where he was on a fact-finding tour connected with the Chernobyl Nuclear Electric Power Station [AES] accident. Is Penyagin satisfied with government replies, Nikiforov asks. He is depressed about them, he says. Penyagin did not suspect such level of incompetence and inadequate and mendacious information. Penyagin adds that deputies, likewise, failed adequately to prepare their questions. He adds that questions must be short. Replies must be to the point. We must learn all this. We must learn not to give

deliberately false information, Penyagin says. He goes on to say: "Well, let us put it this way. Comrade Belousov, talking of our region, Chelyabinsk Oblast, today said that after the 1957 explosion everything had been disinfected there, everything had been put right and everything is altogether fine."

Nikiforov: "Let me make things more precise for the sake of our radio listeners. We are talking of the explosion at a radioactive production waste storage depot."

Penyagin: "Yes. Due to this explosion at the time...[changes thought] or, to be more precise, this explosion affected 270,000 people. This is the enormous extent of this disaster as far as our Ural area is concerned. Industrial reactors are currently operating in this region. Currently 450 million cubic meters of radioactive water have accumulated.

"More complex situations also exist there. I have in mind one of the lakes in which solid nitrate and uranium salts which can simply, can simply explode, are deposited. Today the minister, or to be more correct, deputy chairman of the Council of Ministers, talking of this situation asserts that everything there is just fine. How can one say that? I just thought I will have to put a question as a deputy as a matter of priority. Either he is not on top of the situation, or he is unable to say the truth or else something else, one does not understand what, is at stake here. At any rate, it seems to me, such ministers cannot effectively carry out their work."

Nikiforov: "Aleksandr Nikolayevich, you are naturally well on top of the situation inasmuch as you are a people's deputy from that region, but here you named figures—to what extent, as it were, are they official?"

Penyagin: "Yes, the point is that as soon as our ecology committee got down to work, here I have in mind, well, you can say a year ago, we held the first open parliamentary hearings on the explosion in the town of Kyshtym in 1957. This has been done. Moreover a vigorous debate is currently underway there on the problem of whether or not to build an atomic station precisely on these lakes of radioactive water. That is why I have been dealing with this problem constantly and in earnest—I can not but know what is going on there. I visited the town. I visited the defense enterprise which operates there. And I cannot imagine that comrade Belousov is unaware of these things—he is duty bound to know. But if he is of the view that he can be economical with information for us and that false information can be given then I think, simply, that evidently he underestimates us and that he underestimates the ecological situation that has taken shape in this given case in the South Ural area. One must not talk with deputies in this manner. All deputies must know the truth—only in this case will we learn to adopt correct decisions. Otherwise we will systematically allow errors to occur in decisionmaking and this is all the more the case with regard to political errors."

Nikiforov: "Aleksandr Nikolayevich, what do you think, all that you have been talking about, all these consequences, are these the results of that explosion in 1957—or could it be the case that these are, as it were, some kind of new processes linked with—well, we are aware that your region has, as it were, very intensive production facilities, such as very large metallurgical production facilities and so forth?"

Penyagin: "No, it is simply that, yes, it is, first and foremost, reactors that are operating there at a defense enterprise and the cooling of the reactors is done precisely through these lakes. Well, to reply to the question—this is how such a great quantity of radioactive water built up there. And also another thing—all this depends on the technology of production facilities sited there now. Cheyabinsk 65."

Reportage on Aftermath of Chernobyl Disaster

PM2803114390 Moscow IZVESTIYA in Russian
27 Mar 90 Morning Edition p 3

[Own correspondent N. Matukovskiy article: "Disaster. The Lessons of Chernobyl"]

[Text] We finally have to tell ourselves the whole truth about what happened: The world's greatest technological disaster occurred at Chernobyl. And we have only just started to analyze its consequences and how to minimize them. Today we can only talk about adjusting and adapting mankind and the entire biosphere to the new and irreversible conditions in the wake of Chernobyl.

Millions of people live in the disaster zone. The Chernobyl disaster presented us with exceptionally difficult tasks touching virtually all spheres of life and many spheres of science, production, and morality. Those were the conclusions recently reached by a panel of state experts headed by Academicians N. Moiseyev and S. Belyayev and Doctor of Biological Sciences A. Nazarov.

They proceeded on the basis of the only acceptable and possible approach in the situation. Since the disaster has occurred and we cannot move to another planet, we have to urgently find the most effective ways and means of minimizing the consequences of the disaster not only for the present generation but for future generations as well. Above all we have to save the lives and health of people living in the disaster areas and safeguard future generations against its consequences. Even such major scientific authorities as Yu. Izrael, L. Ilin, L. Buldakov, Ye. Chazov, V. Marin, D. Popov, and others tried to play down the scale of the Chernobyl disaster. (Why they should do so we will discuss later). In a letter to the CPSU Central Committee general secretary, 92 scientists tried to claim that the Chernobyl accident was not as terrible as the scientists from the Belorussian Academy of Sciences tried to make out.

In an interview with the newspaper SOTSIALISTICHESKAYA INDUSTRIYA 29 November, D. Popov stated: "Foreign scientists (namely a group of WHO

experts) were shaken by the radiological ignorance of the scientists from the Belorussian Academy of Sciences. This clearly had more to do with political short-termism and a desire to win prestige with rallies of people than with real science."

Even previously this "rider" had been repeated virtually word for word by Ye. Chazov, USSR minister of health, in his letter to N.I. Ryzhkov, chairman of the USSR Council of Ministers.

In order to put a stop to the confusion that was arising, V. Soldatov, vice president of the Belorussian SSR [Soviet Socialist Republic] Academy of Sciences, turned for an explanation to Pierre Pellerin, director of the French Central Radiation Service, whose authoritative opinion was quote by D. Popov and Ye. Chazov. Mr. Pellerin replied immediately: "I can confirm that during our recent June visit to Belorussia my WHO group colleagues Beninson and Waite, and I myself of course, never called into question the overall competence of the Belorussian scientists. On the contrary, we admired it and have the greatest respect for it. Particularly after our interesting and fruitful exchange of opinions at the Academy of Sciences in Minsk. Of course, the 29 November 1989 claims in SOTSIALISTICHESKAYA INDUSTRIYA are incorrect."

The supporters of the "Moscow" concept hold that nothing terrible will happen to the people living in the accident zone if they continue living where the radiation contamination does not exceed 40 curies per square kilometer. And if the external and internal dose of radiation does not exceed 35 rems in 70 years.

Belorussian scientists, on the contrary, claim that people should not live in areas where they cannot obtain food products uncontaminated by radiation. And contamination means 15 or even 10 curies per square kilometer, not 40. The concept of "35 rems in a lifetime" is unscientific and inhuman, because it fails to take any account of people's health at the time of the disaster, of the existence of "high-risk groups" among the population, or of the large impact dose of short-lived radionuclides received by people at the time of the disaster. It is not possible to measure this amount using physical dosimetry methods, nor is it possible at all to monitor the critical 35-rem "threshold" using existing equipment.

Doctor of Chemical Sciences Ye. Petryayev, chief of the Radiochemistry Faculty at the V.I. Lenin Belorussian State University:

It is impossible to determine this "threshold" during someone's lifetime for another reason, too. The norm for all doses is calculated by reference to cesium alone. Yet in the affected areas there was also a fallout of strontium, plutonium, and a large "package" of transuranic elements, which could be breathed in by a human organism as fine aerosols. The most horrifying things were the "hot particles" measuring a micron and above. In the southern part of the Gomel area there are between one

and 10 such particles per square centimeter of soil. And all these constitute more than the 35 "official" rems!

To be blunt, the "scientific" argument is not about curies and rems, but about how many people need to be resettled and from which areas. Or, to be more accurate, it is about rubles and how many billions need to be allocated to resettlement—10, 15, or 20? Isn't this hypocritical? We say that human life is priceless and we argue about how many rubles to spend on an individual, an adult, a child....

The Belorussian program (which will become a program in the full sense of the world only after ratification by the USSR Supreme Soviet) envisages spending around R18 billion on eliminating the consequences of the Chernobyl disasters in the five years of the current five-year plan.

Why are we talking only about Belorussia? After all, certain parts of the Russian Federation and the Ukraine also suffered. But out of all our country's radionuclide-contaminated territory more than 70 percent is in Belorussia. In order to bring that percentage "home," I would cite the following figures. On the republic's territory where radiation contamination is more than one curie per square kilometer there are 2,200,000 inhabitants—that is, one-fifth of the total Belorussian population. In the strictly monitored area, where the contamination is more than 15 curies per square kilometer, there are 498 population centers with a population of 102,000 people, of which more than 30,000 are children. Some 12,000 people in 85 villages live in a 624-square kilometer area with a radiation level of over 40 curies. You can't touch anything in your own garden or vegetable patch, you can't take a walk in the woods, you can't pick mushrooms or berries, you can't drink the milk from your own cow, you can't swim in the river, and you can't catch any fish. Even adults could not stand such restrictions. Not to mention children!

Belorussian scientists, upholding the "nonthreshold" concept (nobody in the world has yet studied the long-term impact of small radiation doses on the human organism), are concerned for the future of the entire nation.

In the past few years higher levels of disease in the upper respiratory tract, the gastrointestinal tract, and the endocrine system have been recorded in the affected regions. There have been immunity disorders, psychic disorders, diseases of the circulation system, various pregnancy disorders, and cases of major birth deformities. Of particular concern is the state of children's thyroid glands, in which hyperplasia has become widespread everywhere. "Genetic changes, which could contribute 50-100 percent to these diseases," are one of the causes of the deviations that have been observed. We are faced with the fact that there has been a real increase in the incidence of disease among the population living in territories contaminated as a result of the accident. Available information also points to an increase in genetic pathology. In subsequent decades we will hardly

be able to wholly avoid the development of oncological and genetic deviations in a certain proportion of the population.

You might wonder what kind of struggle we can be talking about when we have the kind of official conclusions of state experts that we do. Who could object to such clear and irrefutable facts? Such people exist. Unfortunately, the adoption of a final "overall" decision at the very "top level" depends largely on them. They are, above all, Yu. Izrael, chairman of the USSR State Committee for Hydrometeorology, and L. Ilin, vice president of the USSR Academy of Medical Sciences and director of the Biophysics Institute.

In a written reply to a question from Deputy N. Ignatovich (7 July 1989) V. Marin said: "Analysis of the data obtained as a result of the medical investigation and out-patient monitoring of people living in these areas carried out by the USSR Ministry of Health shows that no diseases connected with the effects of radiation have been recorded among the population of the monitored areas of Belorussia."

D. Popov goes even further, claiming that in the radionuclide fallout areas favorable conditions have been created for people to freely obtain curative doses of cesium equivalent to radon baths. He admits that in these areas, "there has been a growth in many diseases. There is just one diagnosis—mass radiophobia."

In SELSKAYA ZHIZN (No. 29 for 4 February) L. Buldakov also fails to experience any alarm about radiation-contaminated areas. "If all our people," he wrote, "only ate food from the Chernobyl region they would receive just an additional 7 millirems a year. This is just 10 percent of the annual dose, which is not dangerous at all. Not at all!"

But if D. Popov and L. Buldakov are "merely" major authorities in the radiology sphere, V. Marin is a member of the government commission on the elimination of the consequences of the Chernobyl disaster.

Why do many senior leaders so stubbornly uphold the idea that nothing terrible or irreparable happened at Chernobyl in 1986?

A. Stepanenko, vice president of the Belorussian Academy of Sciences:

In ancient times a runner who brought ill tidings had his head cut off. But, of course, it is not a question of "historical fear." When this terrible accident happened, all of us—from mere mortals to Politburo members—instinctively rejected the idea that it was not just an accident but a monstrous disaster whose consequences would never be eradicated. The physicists who had given us assurances for so many years about the peaceful nature of the atom could not be so tragically mistaken! Were they now to take a step back from their initial claims, all of us—from top to bottom—would have the

natural question: "Does this mean you have lied to the people, the government, and the Politburo for almost four years?"

I think that the stubbornness in upholding obsolete and discredited ideas is also explained by the proverbial monopolism of our central departments, particularly on matters concerning notorious "secret" subjects. Just let somebody try to state the opposite opinion! All kinds of means will be brought into play in order to defend their "pure" positions, and the question of how accurate an opponent's objections were comes a long way down the list. This situation is familiar to us in many spheres, but in this instance we can see for ourselves that monopolism and departmental backscratching do not retreat in the face of even the most sacred of concepts.

It is natural we should have begun this conversation with the purely medical aspect of the Chernobyl problem—whether or not people will survive, whether or not they will be healthy. There are a large number of other aspects which are also connected in one way or another with the health of people living both in the actual disaster zone itself and a long way from it. The first concerns peasant labor in areas with a level of radiation contamination of over 15 curies per square kilometer. Belorussian scientists are unanimous that peasant labor has lost all point there. Why should people produce "contaminated" goods and for whom? So that the "shadow" of radiation can spread further and further?

In certain rayons of Mogilev and Gomel Oblasts 40-60 percent of the milk is contaminated. At best they reprocess it and feed the skimmed milk to calves. Meat contaminated beyond all permissible levels is partially reprocessed as meat and bone meal, which is fed to the piglets on virtually all the republic's farms. Monitoring the spread of radionuclides in produce sent from the private sector is utterly impossible.

A. Lyutsko, candidate of physical-mathematical sciences and senior lecturer at the V.I. Lenin Belorussian State University:

The Soviet side's report to the IAEA cites estimates of the anticipated collective dose in the European part of the USSR—300,000 man-sieverts from external irradiation, 2 million man-sieverts from internal irradiation. (For comparison: The total damage in dosage units from the accident at America's Three Mile Island was 35 man-sieverts). The point is that the dosage from food products is several times greater than the gamma radiation dose in the contaminated area. Doctors claim that in terms of cesium content in the body, people from Minsk and Vitebsk have already almost the same amount as inhabitants of Gomel and Mogilev Oblasts. It is necessary to immediately pass a law which would envisage the most rigorous criminal liability for the production and distribution of produce contaminated with radionuclides.

There is an extremely complex problem—moving people away initially from territories where radiation contamination exceeds 40 curies per square kilometer, then 15 curies, and finally 5 curies. It is not even a question of the vast resources needed for such a large scale action. It is possible to at least partially divert the republic's housing program "toward Chernobyl." It is possible to issue a special state loan. It is possible, too, to resolve a very acute psychological and moral problem—that of settling people from the affected regions exclusively in separate settlements (even retaining the names of the old villages) or building separate streets for them in cities and settlements. That will maintain the old ethnic and communal relationships and will more quickly cure the "Chernobyl complex" and their sense of feeling disadvantaged and belief that those around them are to blame.

All this can be done. But there is another problem here: What to do with the lands that have been abandoned? After all, they will run to hundreds of thousands of hectares. Wind erosion cannot be allowed to create secondary radiation.

Problems, problems.... Some will take 5 years to resolve, others 10 years, still others will take 200 years. Then there are those which.... Clearly, no one has studied them as thoroughly as Candidate of Agricultural Sciences A. Volkov, chief of the Land Reclamation Institute's laboratory of problems of the Polesye lowlands. He has spent at least 3 years in the disaster zone, established several thousand metering points, produced hundreds of charts showing the radioactivity level, measured the radiation level in hundreds of population centers, and observed people who have "absorbed" an excessive dose of radiation externally and internally. In some rayons of Gomel and Mogilev Oblasts he was quite simply chased away: "Get out immediately and take your apparatus with you, don't frighten our people, don't cause panic among them!"

Such was the official position not only of the party obkoms [oblast committees] but also of the republic's soviet and party leadership. Briefly, it can be summed up like this: Yes, there was a disaster, but we'll cope with it. We don't need any help from foreigners, we aren't paupers. Back in 1987 the Japanese offered to build a large joint hematology center in Gomel. "Great! So now we're going to reveal our secrets to the Japanese!" (I was present in the office of M.V. Kovalev, chairman of the Belorussian SSR Council of Ministers, when this conversation took place). There is no hematology center in Gomel to this day.

The republic leadership's position has resulted in tens of millions of rubles being wasted building levees which, their designers believed, would keep the contaminated silt in the rivers. It did not work—the silt "crossed" the levees and settled in the places where the current is sluggish. The levees had to be destroyed because they were causing flooding. Tens of millions of rubles have been wasted on useless decontamination, on a reevacuation which was nothing more than an ostentatious

show, and on the construction of new settlements in places where they shouldn't have been built. Some R17 million were wasted just on the "Bratstvo" state farm in Gomel Oblast's Narovlyanskiy Rayon after the Chernobyl catastrophe. Whether this "heroism" was the result of local initiative or whether it was prompted from above has yet to be investigated by an independent parliamentary commission of the new Belorussian SSR Supreme Soviet.

So, A. Volkov has this to say:

Pripyat has been virtually ruined and along with it the entire Pripyat basin over 122,000 square kilometers—it can only be used as an ecological conservation area. Today the waters of the Pripyat and the Sozh and their tributaries, the Nesvich, Iput, Besyad, Braginka, Kolpita, and Pokot, carry radioactive silt into the Dnepr. The Kiev reservoir is gradually becoming a "time bomb." The water is uncontaminated but all the silt is "hot" and there is already 60 million tonnes of it. The whole series of electric power stations on the Dnepr right down to the Black Sea is in great jeopardy. Yet 40 million people live in this area!

Another two problems also give me no rest. An elderly woman once called me out to her house, complaining of daily headaches. Some 300 milliroentgens per hour were recorded in the stove, which she stoked with firewood from the neighboring forest. The firewood was the cause. All the wood in the affected areas is radioactive. It must not be used for furniture, for construction, or even for firewood. The peat is also "hot." Where can people get fuel from?

The so-called "burial sites" simply horrify me. I did not see a single one built according to all the regulations—with concrete walls and a concrete covering. They are generally large pits whose walls and bottom are covered with polyethylene sheeting. In two or three years the ground waters will freely wash away the radioactive dust and run into the rivers and lakes.

I have also made several visits to the "dead zone," which has been turned into a dumping ground where everything is piled up—equipment, clothing, and furniture. Deserted, untended houses "glow" like candles. The fires that break out there when the peat becomes too dry intensify the tragedy. Smoke carries the radiation over a great distance. How can we combat this disaster?

There are two opinions about the future of the cluttered "dead zone." The first is that it should be handed over to the Main Administration for Atomic Power Stations to be sold to foreign scientists, two or three hectares each. This land is indeed worth its weight in gold because it is the only place that truly unique radiobiological studies and experiments can be conducted in natural rather than under laboratory conditions. Nowhere else in the world are there such conditions for scientists.

The second opinion is that since this land is unique it should be left at the disposal of the governments of the

Ukraine and Belorussia. Let them lease it out in return for the requisite medical equipment and medicines. I consider the second option to be fairer—why reward the main culprit?

Another very sensitive question that has not been settled is what should be done with the Chernobyl AES itself. After all, each of its surviving three reactors contain 192 tonnes of nuclear fuel. Last year there were more than 30 "registered malfunctions" in the main equipment at the station, including 13 through staff error.

Belorussian SSR Academician E. Konoplya, director of the Radiobiology Institute:

The Chernobyl AES must be shut down, there can be no other opinion. We do not have the right to tempt fate twice. After all, the land it is on represents a vast blot of contamination from whence radiation is gradually creeping in all directions. Not to mention potential mishaps on a more major scale. Of course, it would be hard to do without its 3 million kilowatts, 1 million of which goes to Belorussia. But a way out must be found—and as soon as possible. Of course, we cannot do without nuclear power in the future. But atomic power stations must not be like the Chernobyl AES; they must be constructed quite differently, a long way from densely populated areas. Is it expensive to transport electricity over long distances? Is it cheaper to eliminate the consequences of the Chernobyl disaster?

My last interview was with Academician V. Platonov from the USSR Academy of Sciences, president of the Belorussian Academy of Sciences:

Our scientists are in an extremely difficult position because they are having to wage a war on two fronts—against the authors of the antiscientific concepts of "35 rems for life" and a "comfortable 40 curies per square kilometer" and against the republic's government, which is displaying astounding "obedience." Ye. Chazov had hardly written his letter to N.I. Ryzhkov than we were told, not without spite: It turns out that you are incompetent! We proposed not building new settlements for the settlers so near the zone—but you built them there. Now they have to be abandoned. We proposed not producing any food products in the strictly monitored zone—yet they are still being produced there now. We proposed immediately evacuating everyone who lived in the zone with more than 40 curies per square kilometer—people are still living there even now. Many people are even living where there are levels of 60-100 curies. It is indeed a question of the nation's future.

Take the following question. Three years ago scientists, writers, and informals claimed that we would not cope with our disaster without international aid. It is only today, after wasting three years, that our government has asked governments, parliaments, and peoples of all countries for aid. We have been talking for a long time about setting up a Belorussian National Committee To Protect the Population Against Radiation and Declare the Republic a National Disaster Zone. We last adopted

a resolution to this effect at a Presidium of the Academy of Sciences 7 March. If the government does this straightaway, we would get direct access to many foreign organizations. We would obtain great aid—scientific, medical, technical, and material.

I listened to Vladimir Petrovich and thought: Will we really stick to our unpopular principle of "We are not paupers, it is not becoming for us to ask capitalists for aid" once again. The scale and nature of the disaster are such that we have no choice. We must make maximum

use of all our resources and means and not be ashamed to ask for help from those whom yesterday we considered to be our enemies.

Today we are all people, living on earth—a planet that is not that large. Ours is a common disaster. It is a crime to the people themselves not to ask for help. If we are offered help, as we were by the Japanese in 1987, it would be simply immoral and inhuman to ponder it and reject it. After all, the Chernobyl catastrophe represents a disaster for the whole world.

CANADA

AECB To Spend More on Supervision of Reactors

51200011 Vancouver *THE SUN* in English
23 Feb 90 p A8

[Article by Ian Austen: "N-Reactor Watchdogs' Budget Raised"]

[Text] Ottawa—The budget of the Atomic Energy Control Board will be increased by 45 percent over the next year to help address long-standing charges that Canada's nuclear reactors are not properly regulated.

In the 1990-91 federal spending estimates, released Thursday, the board admits that its regulatory process for reactors "is insufficient to ensure its mission is fully met."

After its budget is increased to \$35 million, from \$24 million in 1989-90, the board will hire 39 more full-time employees, mainly to improve supervision of reactors.

The new money will also be used to deal with disposal of radioactive waste, said the board's spokesman, Bob Potvin.

In 1988, an Ontario government study and a Commons committee report were both critical of the AECB's methods and its lack of resources.

They called on the board to hold public hearings before new reactor programs begin and to give more consideration to environmental concerns.

Last year the board's president, Rene Levesque, acknowledged that lack of resources could mean that potentially deadly flaws in reactors would go undetected.

There are about four AECB regulators for each of Canada's 22 reactors. In the United States there are about 15 regulators for each reactor.

And to come up to levels of Swedish, British, and French regulators, Levesque said, the AECB would need at least 200 more workers, but the government's commitment falls well short of that level.

In addition to the 39 people promised for the coming year, Ottawa says it will add another 54 by the end of 1992.

Norm Rubin, director of nuclear research at Energy Probe in Toronto, welcomed the increased funding, but said the board's problems are not just financial.

"There have been some improvements in public-mindedness and openness at the AECB, but they're not at the level I'd like them to be," he said.

He welcomed the AECB's plans to begin passing on some regulation costs to utilities later this year.

The use of federal tax dollars to pay all of the regulatory bill has meant that electricity users in the few provinces with nuclear reactors have been subsidized by the rest of the country.

Darlington Reactor Granted License for Full Operation

51200012 Toronto *THE GLOBE AND MAIL*
in English 23 Feb 90 p A10

[Article by Linda McQuaig: "Nuclear License Issued Over Town's Objections"]

[Text] Ontario Hydro finally was granted a license yesterday to operate its Darlington nuclear reactor, but the Town of Newcastle immediately expressed fears that the power plant could be the scene of the province's next environmentally disastrous fire.

Lawrence Kotseff, chief administrator of the town, where the plant is located, said yesterday that there is still no official emergency response plan or fire plan for the nuclear site.

Despite those objections, the Atomic Energy Control Board yesterday granted Hydro a licence for full operation of the reactor. For the past few months, the board has permitted operation only at low power levels, on the grounds that not all safety requirements had been met.

The board, which is Canada's nuclear regulatory agency, said in a statement yesterday that board staff now consider the Darlington safety issues resolved.

Mr. Kotseff said that a tire fire raging in Hagersville, Ont., has raised new questions about the ability of fire fighters to cope with out-of-control fires, and that a nuclear fire could be worse than a tire fire.

The town has refused for months to approve Hydro's fire plan for Darlington on the grounds that some of the facilities there are not in compliance with building-code and fire regulations.

The office of the fire marshal has indicated that it considers the Darlington site safe.

Hydro spokeswoman Michelle McMaster rejected the possibility that Darlington could end up being another Hagersville.

"I see absolutely no connection between the two," she said.

She said that Hydro expects to have the reactor—the first of four at Darlington—in full operation within a few weeks.

FINLAND

Paper Views Prospects for 5th Nuclear Plant

90WP0054A Helsinki HELSINGIN SANOMAT
in Finnish 21 Feb 90 p 2

[Editorial: "Content and Tactics of Discussion About Nuclear Power"]

[Text] The prospect of the fifth nuclear power plant is for the major political parties like a time bomb they don't want to touch. In the big television debate, the television interviewers threw this time bomb into the laps of the party chiefs. Alarmed, they hurled it away as far as they could—that is, to the spring 1991 elections. Will the same thing repeat itself again? Will the bomb now be passed into the citizens' laps in the form of a popular referendum, or will the parties themselves dare to start defusing it?

Roughly a third of the citizens have a positive attitude toward increasing nuclear power availability, another third are negative, and the rest are uncertain. The majorities of the supporters of the Swedish Party, of the Finnish Rural Party, and of the extreme left are probably against the building of the fifth nuclear plant, but some of them are also clearly in favor of it. In the Social Democratic and Conservative Parties, there is severe controversy. Whatever the parties do, some of their supporters will be upset.

Paavo Vayrynen, Center Party chief, fears that bolting the party to an antinuclear position would create an unsurpassable obstacle in government negotiations after the elections. This is why Vayrynen wants to give Parliament representatives a free hand. Secretary Seppo Kaariainen, for his part, favors a public referendum, with the people making the decision instead of the politicians. Public opinion, however, is not divided into two but into three parts. The Swedish referendum in the early 1980's on three equally favored alternatives should serve as a cautionary example on how not to run a referendum.

What we need now is an open debate on energy policy, the outlook for the future, and different available alternatives. The parties and politicians, too, must venture into this debate, and premature decisions by the parties must not be used to restrain it. Nuclear power is for many a matter of beliefs and convictions, and that is why the parties should allow also their parliamentary representatives the freedom to formulate their own stands. And the voters certainly have the right to expect their representatives to reveal what attitude they have toward nuclear power.

FRANCE

Reorganization of Atomic Energy Commission

90WP0060C Paris AFP SCIENCES in French
22 Feb 90 pp 37-39

[Text] Paris—The Atomic Energy Commission (CEA) is quietly undergoing rejuvenation by restructuring its organizational chart and its management methods, "which does not imply a rejection of past structures or staff," emphasized the CEA's director general, Mr. Philippe Rouvillois, during a news conference on 21 February.

The long-awaited reorganization "simply means that the CEA's structures have aged." This reorganization falls within the policy guidelines defined by the government during the Council of Ministers meeting last 18 October and "is primarily intended to break down internal barriers, clarify the distribution of responsibilities within the CEA, and increase its openness to the outside," stated Mr. Rouvillois.

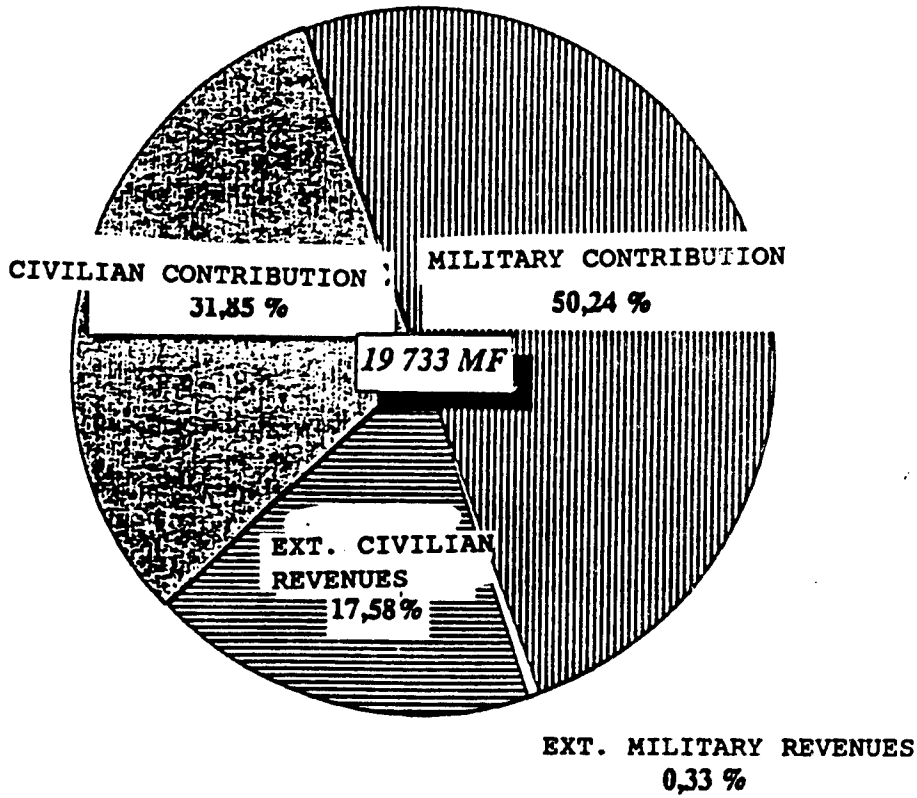
Henceforth, the Commission—which experienced an increase of Fr300 million from outside revenues in its budget of approximately Fr6.3 billion and a reduction of government subsidies—will include three hierarchical levels: Executive Offices, Operational Department, and Divisions.

The IRDI (Institute of Industrial Research and Development) and the IRF (Basic Research Institute) were eliminated in the reorganization, as were the Department of Technologies and the Department of Industrial Relations and Strategy. The top slot will still be filled by the director general aided by the deputy director. The high commissioner in charge of monitoring the quality of scientific activities also remains in place.

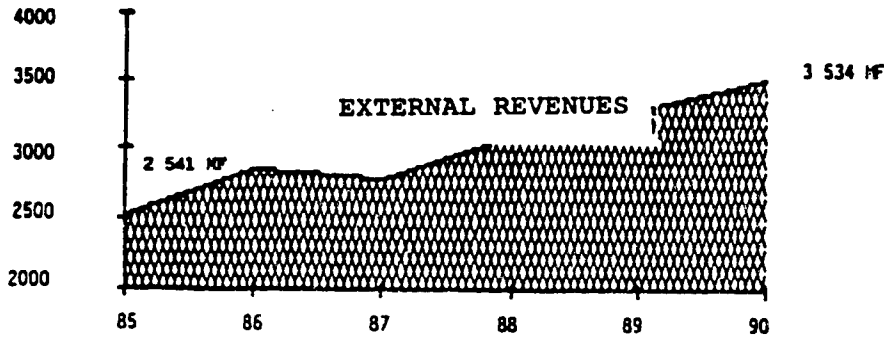
Under these are six departments: DAM (Department of Military Applications—unchanged), DSM (Department of Materials Sciences), DSV (Department of Life Sciences)—these two were previously grouped within the IRF—DRN (Department of Nuclear Reactors), DCC (Department of Fuel Cycle), and DTA (Department of Advanced Non-Nuclear Technologies, Electronics, Materials, Robotics, Metrology). Added to this are the ANDRA (National Agency for the Management of Radioactive Wastes), the INSTM (National Institute of Nuclear Sciences and Technologies), which were not substantially modified, and the IPSN (Institute of Nuclear Safety and Protection).

All eyes are focused on this last organization. First, its director, Mr. Francois Cogne, will be appointed to the newly created position within CEA of inspector general for nuclear safety, "the guarantor of scientific quality on a day to day basis," specified Mr. Rouvillois. Second, the IPSN, whose credibility was implicated in October 1989 by Mr. Rouvillois himself, must demonstrate its ability to make decisions independently from CEA and EDF. "The body of IPSN experts will be more frequently

1990 CEA BUDGET

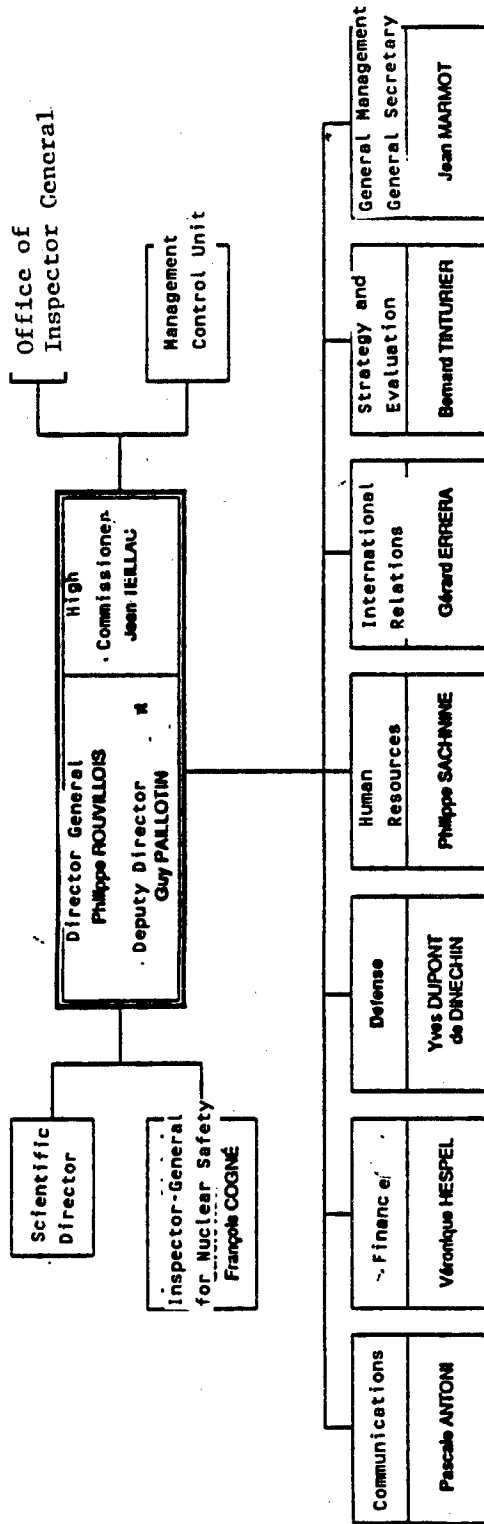


EVOLUTION OF EXTERNAL REVENUES (1985-1990)

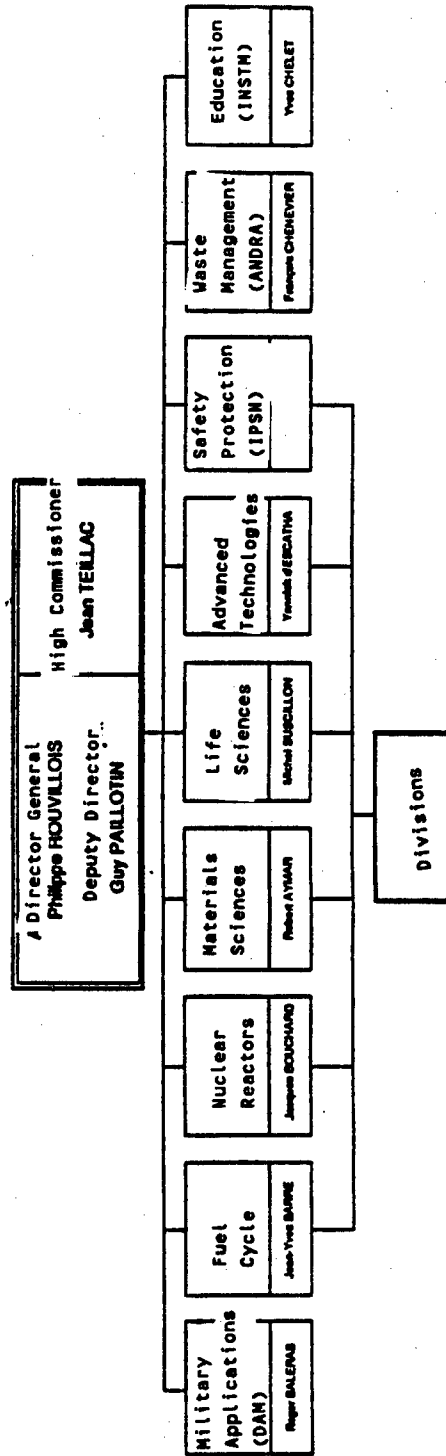


February 1990

ORGANIZATION OF THE EXECUTIVE OFFICES AND FUNCTIONAL DEPARTMENTS



ORGANIZATION OF OPERATIONAL DEPARTMENTS



renewed and they will receive job guarantees regardless of the decisions they make (refusal to reopen a power plant, for example)," emphasized Mr. Rouvillois.

The operational departments which, with the exception of the military sector, will not include more than 2,000 persons, are responsible for the actions to be conducted: They propose objectives, programs, and means and implement decisions that have been made. As for the functional departments (finance, defense, human resources and social relations, international relations, strategy and forecasting, and general secretariat), they now include an independent communications department.

This reorganization does not modify the basic structures of the CEA, its work, or the geographic location of researchers, but "we hope that its effect will be to clarify the decisionmaking structures for them," concluded Mr. Rouvillois.

'Secret' Report on Nuclear Energy Published

90WP0060B Paris LIBERATION in French 7 Mar 90
pp 12-13

[Article by Helene Crie and Dominique Leglu]

[Text] A range of excerpts from an official report on "everything" about French nuclear policy which has been kept secret by the government since last summer and offers its share of criticism. On the spot: EDF, which has built too many nuclear power plants; the CEA, apostle of the breeder-reactor; the government, for its "absence of clear goals."

A report commissioned by the government and kept secret since last summer raises questions concerning certain aspects of France's nuclear energy policy during the past fifteen years. The three authors of this report are Finance Inspector Philippe Rouvillois, who has since been appointed general director of the CEA, the economist Henri Guillaume, CEO of Anvar (National Research Development Agency), and the physicist Rene Pellat, currently chairman of the CNRS (National Scientific Research Center). They were "struck by the extremely fragile nature of world nuclear prospects" and predict that "it may take longer than planned to cross the desert." In this respect, they spare no criticism. Of EDF, accused of building excess capacity into French nuclear facilities and of having "belatedly and inadequately adjusted its projections on the demand for electricity." Of the CEA, criticized for its "aging of men and culture, for turning inward, for a poorly adapted management." Of the government, whose nuclear policy is distinguished by an "absence of clear goals." The authors particularly draw attention to the "big stakes involved in the fuel cycle" (recycling and managing radioactive wastes from power plants as well as uranium enrichment), because "French industry's preeminent position" in the international arena depends on controlling this. Stakes which are now the focal point in the nuclear debate.

The Rouvillois report nevertheless follows the French nuclear policy line. "It is particularly important to avoid raising fundamental questions concerning the strategy chosen by our nation"—to make France the world leader in nuclear energy—specify the three "wise men." It is therefore difficult to understand why the document—which should soon be published by CFDT—was kept secret for nine months. Particularly since these three experts specify in their text that nuclear energy policy will "be established in the long run only if it is based on constantly growing support from the public, which must be kept fully informed."

Selected Passages

What should be done with the wastes, how should aging power plants be managed.... The Rouvillois report analyzes the long-term impact of the nuclear energy program. Excerpts and commentaries:

The 139-page report is structured around four major topics: the international environment, an assessment of France's nuclear position, prospects for nuclear energy in France, the future of the major actors. The report's major statements are quoted and analyzed below.

Public Acceptance of Nuclear Energy Is Dependent on Waste Management

"The problem of disposal—both of irradiated fuels awaiting reprocessing and of wastes generated by reprocessing—may not have received adequate attention from the government, given the critical importance of properly 'closing' the cycle to gain long-term public acceptance of nuclear energy."

For the authors, the waste issue is at the core of the French nuclear system. And rightly so. France's energy policy is unrivaled in the world: France derives 70 percent of its electricity from nuclear energy. During the 1970's, this solution was presented as the nation's only way to avoid dependence on oil imports and received relatively good public acceptance, unlike the situation in other countries such as the United States, Italy, Austria, or Sweden. But the nuclear energy industry, even (and especially) when it reprocesses spent fuels, generates wastes. As long as these could be stored in the reprocessing plants (Marcoule and the Hague), public opinion was not concerned with their fate in the long run. But two years ago, the search for a suitable permanent disposal site began to create a stir. Thus, apart from burial, is there any way to neutralize these end of cycle wastes? This possibility raises fundamental questions concerning the viability of the overall nuclear program, particularly with respect to the reprocessing option, which produces wastes with extremely long half-lives.

"Rapid construction of the underground storage site appears to be indispensable. Only this measure will provide for effectively 'closing' the fuel cycle.... From the

standpoint of public opinion, the viability of the reprocessing option will become increasingly dependent on effective management of nonrecoverable radioactive materials....

Increasingly, it appears that the dominant constraint in this area is the local population's willingness to accept the principle of the storage site, far more so than the relative technological advantages of the different types of subsoil (granite, salt, slate, clay)."

In fact, the National Agency for the Management of Radioactive Wastes (ANDRA, a CEA subsidiary) has, for the past two years, faced local opposition to the geological studies that must be conducted in order to select a site. Opponents and environmentalists have always believed that ANDRA would, in the end, retreat to the area where opposition is weakest. For obvious safety reasons, this is cause for concern.

"Under these conditions, it appears indispensable that the government quickly select a site in order to avoid crystallization of public opinion against projects, three out of four of which will be dropped in any event. A major criterion in making this selection will be avoidance of public opposition at the national level, such as that generated for the Plogoff nuclear plant project."

This recommendation for quick action must have escaped the government since, on 8 February, Michel Rocard, overwhelmed by opposition, froze all prospecting activities for a burial site for at least one year.

Dismantling Old Facilities Will Cost More Than Expected

"The question of dismantling has not until now been raised on any significant scale, because the system is relatively new.... There exists today no process or precedent of cooperation among the different actors in the system."

Because the plants are nevertheless unquestionably aging, Cogema commissioned a study on projected costs and operations which "led it to substantially increase the volume of yearly allocations set aside by the company for downgrading, the cost of which could vary between 10 percent and 50 percent of the initial investment cost."

"The cost of downgrading existing nuclear plants will be high, in any event... These operations are therefore likely to result in long-term increases in total costs for the nuclear energy industry."

Currently, only two nuclear power plants have been fully downgraded: Chinon 1 and Brennilis (in process). But these operations, designed to neutralize the sites, cannot be duplicated for the rest of the sites.

"Downgrading from 'level 3' (decontamination of all irradiated equipment and facilities) cannot be contemplated at this time, particularly given the volume of highly radioactive wastes which such operations would

generate." It can therefore be expected that a less dramatic procedure will be adopted for nuclear power plants nearing the end of their cycle. "Maintaining the core of the reactors and the most active cells in their existing condition, and dismantling and decontaminating peripheral facilities... which will require sustained monitoring of the facilities in question." For hundreds of years.

EDF Is Responsible for its Overproduction

"As early as 1982, the excess nuclear capacity projected for 1990 was estimated to be one or two tiers. The current assessment is seven to eight tiers, or approximately ten GW (gigawatts)...."

This excess capacity originated from multiple sources, including inappropriate projections by EDF, which the report criticizes for the following reasons:

"EDF belatedly and inadequately corrected its electricity demand projections. While, prior to 1970, consumption doubled every ten years, it increased by a factor of only 1.7 between 1970 and 1980 and 1.4 between 1980 and 1990. EDF did not adequately account for this slowdown until 1983, when it developed its own economic growth scenarios rather than relying on forecasts prepared by Planning."

Consequences of Excess Capacity.

This excess capacity produces two sets of consequences, which in turn create new problems both for EDF and for its suppliers.

—For EDF:

"The continued development of electricity exports (is) an imperative for EDF." Except, "from an economic standpoint...exports are not very profitable for EDF: 22.4 centimes per kilowatt/hour on average (1987) vs. 22.5 centimes for the total production cost of a basic nuclear power plant.... Given the conditions now prevailing in the European market, ...it would not be profitable to build new power plants for the sole purpose of exporting the electricity produced."

The report very explicitly contradicts EDF's public position, which always stresses its success as an exporter of electricity. Thus, in his news conference last 30 January, EDF Chairman Pierre Delaporte was delighted to confirm "EDF's export-oriented avocation with 42 TWh (terawatts/hour) exported in 1989 and foreign currency revenues of Fr8.2 billion, making a positive contribution to France's balance of trade." This analysis clearly obscures the fact that these sources of funds are in fact generated at a loss....

Nevertheless—and this is not a minor paradox in the report—it is recognized that it would be "desirable to effectively create a true European market for electricity during the coming years."

—For the suppliers:

"The excess capacity has serious consequences..., first for Framatome, insofar as its orders for new power

plants have almost come to a complete standstill... According to its own projections, Framatome's revenues from boilers could drop from Fr5.6 billion in 1987 to 850 million in 1997. But this also affects Framatome's subcontractors for the nuclear components of the power plants.... Already, the number of industrial workers...has fallen from 150,000 at the peak of the plant construction period to 50,000 today. Further decreases are anticipated.

The sale of a power plant to Pakistan, a promise made by Francois Mitterrand during his trip to that country two weeks ago, cannot obscure Framatome's severe problems; its revenues are expected to plummet, thus generating unemployment. The report even questions the very future of Framatome, whose spectacular and "seemingly balanced" agreement with Germany's KWU could have serious consequences. The report clearly asks the following question:

"Will Framatome, with or without dynamic management, in the long run be able to fight off a vassal relationship if the agreement is extended in the future to all of its activities as a nuclear boiler producer? This is one of the main reasons for asking questions concerning the future of its ownership...."

Western Uranium Mines Close Down

*90WP0060A Paris LES ECHOS in French
6 Mar 90 p 19*

[Article by Brigitte Challiol]

[Text] The western uranium mines are closing one by one and, within two years at the most, the Vendee Mining Division, one of the four Cogema establishments which produces natural uranium in France, will have ceased operations. This closing is primarily due to lowered profitability: Because of the collapse in world prices, the mineral content of the Vendee product is deemed to be far too low.

Operations at the Ecarpiere mine in the Getigne community in Loire Atlantique (75 salaried workers, annual production of 150 tons of uranium) ceased several days ahead of schedule: Inclement weather during the month of February hastened the process by flooding the mines with water. Similarly, activities at the Piriac mine near Guerande (Loire-Atlantique) have been suspended. At Piriac, the mineral is richer but the extraction costs were finally found to be excessive.

From now until 1991, two other sites will be abandoned: the Chardon site in Loire-Atlantique (80 employees) and the La Commanderie site in Deux-Sevres (80 employees). Finally, the operations of the Societe Industrielle des Mineraiis de l'Ouest (120 employees) where the uranium is concentrated will be suspended for two more years.

The Vendee Mining Division, created in 1950, employed 800 workers in its heyday in 1957, compared to 472 today. That was the golden age of uranium. But everything changed five years ago when Cogema applied for new operating permits. Very active defense committees were created in Morbihan where Cogema finally withdrew because it found the residents' demands to be excessively burdensome. Since 1988, opposition to uranium has also emerged in Maine-et-Loire and in Vendee.

Local elected officials place more importance on "quality of life" for their citizens, in spite of the opportunity cost of closing the Vendee Mining Division (in 1988, Cogema's regional economic impact was estimated at Fr220 million).

Most of the employees will be relocated, either to other Cogema sites in France or through retraining agreements.

EDF Report Notes Danger of Malfunction

*90WP0048B Paris LIBERATION in French
15 Feb 90 p 43*

[Article by Dominique Leglu: "Nuclear Power: The Risks Are Becoming Tangible"]

[Text] In an internal report, EDF [French Electric Power Company] estimates the probability of a serious accident in any given year at one in 100,000. In other words, the probability of such an accident taking place somewhere in France in a 10-year period is 0.5 percent. Targets for criticism: faulty design, reactor safety procedures, and human error...

"It must be assumed, therefore, that in the current state of safety conditions at EDF facilities, the chances of a serious accident¹ somewhere in the system in the next 10 years might be as much as several percent." The "several percent" referred to by Pierre Tanguy, inspector general for nuclear safety, in an EDF internal report published yesterday by LE CANARD ENCHAINE, has certainly shaken people up, though he actually said nothing new. Tanguy wrote essentially the same thing in an article titled "Le Retour d'Experience" ["The Results of Experience"] in a supplement to "La Recherche: Risques Naturels et Technologiques" ["Research: Natural and Man-Made Hazards"] in which EDF first came out with its fresh look at the risks of nuclear power.

In the first place, major accidents—i.e. reactor core meltdowns, whether or not followed by a release of radioactivity into the air—are now a recognized feature of the new French "PAN" (Nuclear Accident Landscape), a landscape that was radically changed by Three Mile Island (1979) and Chernobyl (1986). And in the second place, such accidents could occur more often than plant designers and operators previously admitted. More precisely, serious accidents "have a probability of one in 100,000 per year," Tanguy wrote. Given the fact that there are 50 facilities in operation, the probability of an accident somewhere in France is therefore 0.5 percent

over a 10-year period. Previously, chances of a major accident at any one facility were considered negligible, on the order of one in 10 to 100 million. Indeed, what strikes one most in these "documents concerning nuclear safety presented to the 'ad hoc' nuclear safety meeting of 18 January 1990 by the general manager" is the tone: It is one of concern, and sometimes even outrage.

First of all, concern. The year 1989 was a "hot" year for nuclear safety at EDF, a "turning point." Tanguy divides incidents into three groups. Let us consider, for example, problems related "to the aging of the installations. The most serious example is wear and tear on the control rod clusters of the 900-megawatt reactors, which is more rapid than expected and at Gravelines even caused them to seize up." Another type of problem, he wrote, was more "disturbing, in that it results from inadequate specifications for modifications to the design or manufacturing process on systems which at the current stage of the pressurized-water reactor program² could be considered thoroughly proven."

Tanguy singled out "two major generic problems with the 1,300-megawatt units" which "stood out most strikingly in 1989": "defective welding" in the pressurizers (very important elements in the reactor's primary hot water removal system), "defects attributable to a design error;" and even more serious, the "new phenomenon of warping observed in the steam generator pipes...followed by cracking caused by corrosion under stress; the cause of this warping is still under discussion." Even though he believes EDF has dealt responsibly with these problems, Tanguy observed that "it will be several years before completely 'normal' conditions have been restored."

So it is no surprise that the inspector general for nuclear safety urged his colleagues to "be particularly attentive to any incidents which are in part the result of flaws that may be unrelated to operations per se," noting that special attention must be paid to "warning signs" that may presage an incident. In addition to the aforementioned problems, he cited "unexpected deterioration of the control rods and the consequent risk of jamming, resulting in the non-operability of an essential safety feature for the regulation of reactivity." A sudden escalation of reactivity in the reactor core was what caused the Chernobyl catastrophe. Also noted were various "errors in modification of the safety programming logic—errors which quality control failed to detect—that could lead to event sequences not taken into account in system design." Which means, essentially, that the possibility of certain types of incidents or accidents was not taken into account....

There is also a clear tone of outrage in the report, and targets of criticism are found both within and outside EDF. Internally, he showed no mercy: "What is most critical, at least from the standpoint of safety," is the "human factor." Overall, he said, employees "do not seem fully cognizant of the seriousness of the stakes, and this is true at every level, especially at the higher levels including 'managers.'" Externally, his wrath falls on

SCSIN (Central Safety Service of Nuclear Installations), which comes under the Ministry of Industry and has the power to impose its will on EDF: "SCSIN, with its declaration of independence, its harsh criticism of EDF's nuclear plant operations, must bear primary responsibility for the public's loss of confidence in nuclear power." In fact, real battle lines have been drawn between EDF and SCSIN over the "classification scale" (established under Alain Madelin) used to evaluate the seriousness of nuclear incidents or accidents. While EDF may consider 1989 to have been a "turning point", 1990 should be a year of conflict on every front, from reactor safety to waste burial, and everyone will be involved: the AEC [Atomic Energy Commission], COGEMA [General Nuclear Materials Company], ANDRA [National Radioactive Waste Management Agency], EDF, and SCSIN.

Footnotes

1. A "serious" or Class 5 accident on the six-point incident classification scale, is defined as one posing "a radiological risk so serious that governmental authorities deem it necessary to implement the emergency plan (PPI or 'special measures plan') at the site."
2. Almost all of France's nuclear plants use pressurized water reactors.

Research Reactor Was in 'Overdrive'

90WP0048A Paris LE MONDE in French
30 Jan 90 p 42

[Article by Claude Francillon: "Nuclear Research Reactor in Grenoble Was in 'Overdrive' for 19 Years"]

[Text] On 24 January the Laue-Langevin Institute's high-flux reactor at the Grenoble nuclear research center was shut down by order of the Central Safety Service of Nuclear Installations (SCSIN).

The operator determined from measurements and calculations that the research reactor had been operating at 10 percent over its maximum authorized power level of 58.3 megawatts ever since going into service in 1971. It was thus consistently providing its users—some 2,000 researchers, most of them French, German, or British—a neutron flux greater than what should have been generated.

Over the last several months, management personnel at the reactor have noted with surprise that their unit was burning more uranium than the power level should have required. Some even went so far as to accuse the American supplier of providing under-enriched uranium to the Institute.

Finally, and almost "by chance," the mystery was cleared up by calculations carried out at the Institute on readings obtained with an instrument that measures the flow rate of reactor cooling liquid. The Grenoble reactor uses 40 tons of heavy water. But the flowmeter installed in 1971 had been calibrated for light water. The 10

percent higher density of heavy water had not been taken into account in previous calculations.

There has never been a major "incident" at the Grenoble reactor. Mr. Bauer, head of the Institute's reactor department, said in a 26 January communique that "this operational anomaly had no side-effects on people, the environment, or the equipment," adding that the reactor, even when generating excessive power, still had a 10 percent safety margin. The nuclear safety service nevertheless demanded the reactor's shutdown because of what it called a "serious anomaly which could require a reassessment of safety procedures." SCSIN, which uses a five-point scale in assessing the threat posed by reactor safety problems, rated it a Class 2 incident. The facility will remain closed until after an investigation, and will operate thereafter only at the originally authorized power level. In effect, despite its successful handling of the 'overdrive' condition, the research reactor will have to be operated in accordance with its original performance specifications: Even if, as its French, English, and German users are trying to prove, the structure of the unit has not been damaged by the "incorrect" use.

Comments on Nuclear Plant Sale to Pakistan

*90WP0053B Paris LE MONDE in French
23 Feb 90 p 8*

[Article: "Dangers of Proliferation"]

[Text] Should Pakistan's use of imported nuclear technology be subject to severe constraints? Yes, definitely. For Pakistan's tumultuous history in nuclear development suggests caution is in order.

Everyone remembers Islamabad's numerous, often unscrupulous and sometimes successful attempts to obtain nuclear fuel cycle technology. Any country that masters this technology can of course use it to produce nuclear fuel for civilian purposes, but also—and this is the sticking point—for military ends.

To become a civilian nuclear power in its own right, Islamabad has in the past signed cooperation agreements with advanced countries. But one can see looking back that Pakistani authorities—not that they are alone in this—have always sought to acquire those nuclear technologies which pose the greatest threat of proliferation. For example, there was the order they placed with France for a spent fuel reprocessing unit, an order which fortunately was canceled.

It would have been playing with fire to turn that technology over to them, for with it they could easily extract plutonium from the spent fuel rods used in small reactors. Several kilograms of plutonium can be turned into an atomic bomb, with a bit of know-how. It is fortunate that the order was not accepted, but this has not prevented the Pakistanis from taking another tack: uranium enrichment by means of ultracentrifugation.

While this modern technology makes it possible to manufacture mildly enriched fuel (a few percent) for use in civilian nuclear power plants, given enough time it can also produce highly enriched uranium (more than 90 percent), which could then be used to make atomic bombs. According to intelligence sources, Pakistani authorities have succeeded in acquiring from European suppliers the blueprints and materials needed to build an ultracentrifugation enrichment plant at Kahuta. A second such plant is reportedly under construction at Golra-Sharif, according to information gleaned from spy satellite photos.

One might ask whether the United States is justified in fearing that the sale to Pakistan of two French 900-megawatt pressurized water reactors [PWR's] similar to those in France's own nuclear power program poses a threat of proliferation. Although the U.S. is right to insist that all possible precautions be taken, it exaggerates when it claims that such reactors are highly "proliferous." The fuel they use is only mildly enriched (on the order of 3.5 percent), and thus not really useful for military purposes.

IAEA Monitoring

Also, this kind of reactor—of which there are about 30 in France—does not lend itself well to plutonium production. Some is produced, of course, but by reason of its lengthy confinement (at least one year) in the reactor core, it is of very poor quality and thus almost unusable. Thus it would be more intelligent—and Argentina understood this very well—to buy a reactor that uses heavy water and natural uranium, like those manufactured by the Canadians; fuel in such reactors can be off-loaded without shutting down operations.

When the time is right, the best plutonium isotopes are easily skimmed off. It should be noted that Pakistan already has a small, 130-megawatt Canadian (Kanupp) reactor of this type installed near Karachi.

So the real problem is to make sure inspectors from the International Atomic Energy Agency (IAEA) in Vienna will be completely free to monitor all these installations. In February 1985, one high official at IAEA said he had never run into problems carrying out his inspections. But Pakistan, even though it is a member of the IAEA, has steadfastly refused to sign the nuclear nonproliferation treaty unless India is also a signatory.

Dilemmas Faced in Nuclear Waste Disposal

*90WP0053A Paris L'EVENEMENT DU JEUDI
in French 15-21 Feb 90 pp 32-34*

[Article by Murielle Szac-Jacquelin: "When Our Nuclear Trash Can Overflows"]

[Text] Shocked by the wave of concern over radioactive waste, Michel Rocard has halted plans to create four new waste burial sites. And what if we simply quit producing these almost everlasting toxins?...

State security police up against whole communities, demonstrations, occupation of sites, local elected officials up in arms, antinuclear slogans: We see it in every corner of France and Rocard has seen it in Bresse (Ain), Champagne du Nord (Aisne), Anjou (Maine-et-Loire), and Gatinais (Deux-Sevres). One of these four spots in the beautiful French countryside was to be chosen as a disposal site for our most toxic nuclear waste. So it is easy to understand the strong feelings of the inhabitants, who have no desire to live next to a radioactive waste dump. The government no longer knows what to do about the problem. Rocard has just suspended all the studies under way and is consulting with the College of Technological Hazards Prevention. But the problem remains: what to do with our constantly growing stockpile of radioactive waste? The following analysis gives an overview of the issues.

What Is Nuclear Waste?

An ordinary stove burns coal; a nuclear reactor "burns" enriched uranium. Once burned, the coal turns to ashes, while enriched uranium is transformed into spent fuel; reactors have to replenish one-third of their fuel each year. In France the spent fuel (1,200 tons per year) is reprocessed, to separate out the various elements of which it is composed. It is during reprocessing that the most dangerous waste products are isolated. Plutonium and the now-depleted uranium are isolated for recycling. But about three percent of the slag, fission products, and uranium derivatives (the transuranic elements)—very hot and highly radioactive—cannot be recycled. This so-called highly active waste must be buried, along with all articles and materials that were in contact with the radioactivity during reprocessing (gloves, clothing, metal casing...).

Is There a Way To Avoid Producing it?

Could the waste problem be solved simply by not reprocessing the spent fuel? No, because it would have to cool down in water tanks for several decades before final disposal. Opponents of reprocessing say their solution would eliminate the wastes produced during the operation. They believe the radioactivity would be contained more safely if it stayed inside the fuel. Experts at COGEMA [General Nuclear Materials Company], the company that handles reprocessing, disagree. According to these experts, reprocessing neutralizes the radioactive elements more effectively; and it would be a shame to throw out all the reusable plutonium and uranium. But whichever option is chosen, we still have highly radioactive materials on our hands.

Are the Buried Waste Products Dangerous?

A small part of this waste—fission products—is supposed to lose its radioactivity in 300 years; the rest (the transuranic elements) will take several hundred thousand years. It will be buried in the form of glass, thanks to a vitrification process which COGEMA certifies as absolutely leak-proof. In the short term these wastes

present no danger to the population. But there is still debate about the long term. Opponents of burial maintain the radioactive packages could be weakened by underground water. The water might then carry contaminated particles to the surface. Such contamination, which COGEMA says is impossible, would not occur until several centuries from now. But who can guarantee the long-term safety of the packages against the possibility of an earthquake, a geological modification of the soil containing the waste, or even the actions of our remote descendants? Will they even remember where the waste is buried?

Can We Do Without Reprocessing?

The idea that reprocessing is indispensable always went unquestioned; the choice was made long ago, and the assumption has never been put to the test. These are not the words of an ecology militant, but rather of Philippe Rouvillois, new director of the all-powerful CEA (Atomic Energy Committee). In a report commissioned by the government, Rouvillois attacked the CEA's procedures, contending that although politicians had saddled it with responsibility for making the decisions, the committee seemed unable to ask the important questions. Soon after turning in this explosive report, Philippe Rouvillois himself was named head of the committee he had criticized. Could this be a sign that France's nuclear policy was bending under pressure? In the six months since his installation, the new director has not yet made any dramatic changes. But reprocessing has been brought more and more openly into question: The original idea was to reuse plutonium in breeder reactors and to recycle slightly spent uranium.

Today the breeder program is on ice. Superphoenix, the Creys-Malville prototype power plant, appears likely to remain one of a kind for a very long time. Recycled uranium costs much more than natural uranium, and its properties are not that exciting. So why do we recycle? COGEMA is still convinced breeder reactors are the wave of the future. In the meantime, an interim fuel called MOX has been developed, but it reuses plutonium extracted from the spent fuel. Today MOX is only in experimental use, and Brice Lalonde is firmly opposed to plutonium recycling. Within EDF [French National Power Company], highly placed officials privately admit the reprocessing option is very costly, much too costly. At SCSIN [Central Safety Service of Nuclear Installations], no one ventures to express an opinion. The silence sounds suspiciously like a disavowal; SCSIN is casting doubt on the official line. Once existing contracts to reprocess foreign waste have been fulfilled, will new ones be signed?

Where Is the Waste Stored Now?

The highly radioactive waste destined for burial is kept at Marcoule and La Hague. Currently there are 1,720 blocks of vitrified waste at Marcoule and 143 at La Hague, where a reprocessing plant just opened. "The waste is not dangerous at its present location," says

Maurice Delange, head of reprocessing at COGEMA, "but it must be kept constantly under surveillance. It is impossible to maintain such surveillance for hundreds of thousands of years; that is why it must be buried."

Does it Have To Be Stored Underground?

Even if reprocessing should be discontinued or replaced by a more advanced method, there will still be long-lasting radioactive materials that require storage. And according to the great majority of experts, that means underground. Opponents of burial believe it makes more sense to keep the waste products readily accessible until some means is discovered to shorten their radioactive half-life. The agency which manages waste storage (ANDRA) [National Radioactive Waste Management Agency] solemnly swears the packages can be quickly recovered from their underground storage sites whenever a way is found to "disarm" them. For a long time now, some specialists have been calling for research on more advanced reprocessing techniques to isolate the most dangerous products, the transuranics (radioactive for at least 200,000 years). Those products could then be put back into a reactor to transmute them into waste with a short half-life. The mechanics of this very complicated and very costly procedure have not yet been perfected. But that is no reason to dismiss it...

Why Wasn't the Question Asked at the Outset?

In the 1970's, when France's gigantic nuclear program was launched, the top priority was to produce energy. So all the money went into studies on reactors and reprocessing. "We knew from the start we had to face the problem of waste and store it underground, but all we had were interim solutions," admits COGEMA's Delange. In short, we had our heads in the sand. Today we are burdened with huge amounts of waste, and we have to do something with it.

What Are Other Countries Doing?

Most countries, including the United States, the USSR, Canada, Korea, and Taiwan, are still storing their spent fuel in water tanks while trying to decide what to do. Sweden is the only country that has definitely decided against reprocessing. After four decades or so of storage in water tanks, Sweden's spent fuel will be buried underground in copper storage vessels. France, through COGEMA, performs 80 percent of the world's reprocessing. Belgium, Holland, and Switzerland send their old fuel to La Hague. Germany stopped work on its own reprocessing plant and will instead have its fuel recycled in France and Great Britain. The Japanese are sending some of their fuel to La Hague until their second reprocessing plant comes on line. All of the plant's clients are contractually obliged to take back their waste. But as of today the foreign nuclear waste is still being warehoused in France: The vitrification facility has only just opened. What will become of this waste in the future?

Why Was the Issue Never Debated in France?

The battle of the physicists has been a lop-sided one: Opponents of reprocessing never had a chance to conduct officially sanctioned research or perform experiments to evaluate the risks and costs of the alternatives they proposed.... The CEA's decision in favor of reprocessing was never challenged. A committee headed by Professor Castaing had proposed exploring all the other options (advanced reprocessing, delayed reprocessing...). To date, its recommendations have remained mere pious hopes, but Professor Castaing is one of the experts Michel Rocard has summoned to the rescue. So there is finally going to be a debate. But perhaps a little late.

UNITED KINGDOM

Nuclear Triggers Intercepted en Route to Iraq

LD2803181290 London PRESS ASSOCIATION in English 1645 GMT 28 Mar 90

[Article by Peter Archer, PRESS ASSOCIATION home affairs correspondent]

[Excerpts] Forty nuclear trigger devices—enough to detonate one or two nuclear bombs—were seized at London's Heathrow airport today as they were about to be loaded on a flight to Iraq.

British and American customs investigators arrested five people.

They were caught trying to smuggle 40 krytron triggers, a sophisticated electrical switch which forms part of the nuclear detonation chain.

One of the five, an Iraqi, is being deported after his country's ambassador was summoned to the Foreign Office.

The four others are three Britons, including a woman and a naturalised Iraqi-born man, and a Lebanese.

The gang was tonight being questioned at a secret location by customs investigators.

The swoop came after a protracted inquiry by investigator [words indistinct] the United States to Britain, and on to Iraq.

It is understood American customs officers working undercover early last year discovered a plot to smuggle the nuclear triggers to Baghdad.

The Americans kept surveillance on the plotters and when it became [words indistinct] to Iraq was through the United Kingdom, British customs chiefs were alerted.

The trap was set but arrests could not be made until documentation was completed, freeing the nuclear triggers from a Heathrow warehouse to be loaded on to an Iraqi flight.

Police from Scotland Yard's deportation squad arrested two men at Heathrow.

The three other gang members were arrested at addresses in London and Surrey. [passage omitted]

The triggers were stored in TWA's transit shed at Heathrow and were probably disguised as machine parts.

Trade in the triggers is prohibited with certain countries under the 1989 export of goods (control) order.

The regulations, drawn up by the 17 member states of the Coordinating Committee for Multilateral Export Controls (COCOM), including European countries and the United States, deny regimes like Iraq access to materials with possible uses in the development of nuclear and chemical weapons and missile technology.

Company Denies Illegal Dealings With Iraq

*LD3003142490 London PRESS ASSOCIATION
in English 1337 GMT 30 Mar 90*

[Text] One of the companies searched by customs officers investigating an alleged Iraqi smuggling operation today denied supplying equipment or services without first clearing them with the British authorities. The officers seized large quantities of documents from the raids on Global Technical and Management Services International, based in Deeside, North Wales, and a company in Edinburgh. Inquiries are understood to centre on the alleged smuggling to Iraq of acoustic detonators for sea mines which can distinguish between friendly and enemy ships.

Global said in a statement it had recently completed a contract for clearing Iraq's offshore waterways of mines and debris and intended increasing its links with the country. It continued: "Global is currently negotiating several contracts in Iraq and regards it as an important market place in which it enjoys an enviable reputation. It intends to increase its activities in Iraq and intends continuing to transfer technology and knowledge to Iraq. However, Global is equally committed to a policy of openness and would not provide any services to Iraq or any other foreign country that was not accepted or sanctioned by the British authorities."

Customs officers searched its offices, as well as those of its accountants and solicitors and the homes of two directors, on Wednesday morning and a large quantity of documents relating to the company's activities in Iraq were taken.

The statement said: "The precise nature of their investigation is at this time not clear to us. However, we believe that customs suspect Global of having been involved in exporting prohibited materials to Iraq."

Global was specifically incorporated to carry out a contract to survey Iraqi offshore waterways of ordinance and other debris in order to make them safe for navigation and movement of shipping.

The statement went on: "The project involved the supply to Iraq of equipment and personnel (many of which were ex-special British forces) to carry out the contract of works and also to train Iraqi navy personnel. Prior to the award of the contract, it was discussed in depth with British Embassy officials in Baghdad. Copies of the contract document were distributed to the British Embassy, all major U.K. suppliers and third parties involved within the project." The company said the contract had begun on January 5, 1989, and was recently completed, with all works witnessed and certified by Lloyds Register. "We emphasise no equipment or materials were supplied outside those listed in the contract."

Liberal Democrats Face Dissension Over Nuclear Power

*51500095A London THE DAILY TELEGRAPH
in English 1 Mar 90 p 14*

[Article by Jon Hibbs]

[Text] The Liberal Democrats face fresh turmoil at their spring conference later this month over proposals to commit the party to phasing out nuclear power by the year 2020.

Recent internal arguments within the policy committee are expected to spill over into a heated debate at Cardiff that could reopen old wounds between the former Liberal and SDP [Social Democratic Party] wings of the party.

Mr. Paddy Ashdown launched the proposals yesterday with an admission that after several years of confusion it looked as if the new party had returned to its Liberal roots, opposed to nuclear power in all forms.

But he insisted that the doubts of former SDP pragmatists could be won over by a policy that offered enthusiastic support to free market mechanisms for curbing environmental pollution.

The Liberal Democrats are the first political party openly to endorse the introduction of licences to control emissions from power stations and manufacturers. Such a scheme has been recommended to the Government by Prof David Pearce, special adviser to Mr. Patten, Environment Secretary.

Under such a scheme the government would sell permits to individual companies putting a ceiling on the amount of carbon dioxide or other greenhouse gases they could produce.

Mr. Ashdown said: "I predict this proposal will become an important instrument for the protection of the environment within a free market system. It ought to be seriously considered by the government."

The policy green paper, "Energy and the Living World," calls for a halt to the building of the Pressurised Water Reactor at Sizewell B, and says no new nuclear power stations should be built. It also urges the withdrawal of

all existing plants from service by the year 2020 or even sooner if this could be achieved without incurring additional environmental costs.

It calls for a British target of a 30 percent cut in carbon dioxide emissions by 2005 to reduce global warming, the creation of a new Department of Environmental Protection, and differential taxation to penalise car drivers whose vehicles most pollute the atmosphere.

Energy Secretary in Row Over Nuclear Waste Disposal

51500091 London *THE DAILY TELEGRAPH*
in English 9 Mar 90 p 6

[Article by Charles Clover: "Patten Under Attack in North Sea N-Waste Row"]

[Text] Britain was isolated from all eight other North Sea countries last night as a furious row over the disposal of nuclear waste with the Danes, Dutch, and Swedes brought an acrimonious end to the Third North Sea Conference.

Mr. Patten, Environment Secretary, came under attack at the conference in The Hague from three of Europe's leading women politicians from Holland, Denmark, and Sweden.

Mrs. Hanja Maij-Weggen, the Dutch transport minister and chairwoman of the conference, broke with diplomatic convention and rounded on Mr. Patten over Britain's slowness in phasing out sewage sludge and industrial waste dumping. She also attacked his refusal to compromise on the issue of nuclear disposal shafts at sea.

Mr. Patten refused to accept a proposal from the Dutch chairman, seconded by all eight other signatories to the Hague Declaration, ruling out the possibility of disposal shafts for nuclear waste with access from the sea by means of artificial islands or ships.

He said international nuclear authorities had not declared this disposal method unsuitable.

Mrs. Maij-Weggen said: "We have had two problems in this conference. One is the question of nutrients and the other is the United Kingdom."

She added that all countries present were disappointed that Britain would not rule out the sea shaft option for the disposal of nuclear waste.

Mrs. Lone Dybkjaer, the Danish environment minister, said the British reservation, expressed in a footnote to the Hague Declaration, was "unacceptable."

"Here they are playing with all our lives. We are very, very sorry for future generations," she said.

Mrs. Brigitta Dahl, the Swedish environment minister, said: "We've spent a lot of time trying to bring the United Kingdom with us. I will not give up. I am very stubborn."

British officials accused the Dutch chairwoman of rudeness and of indulging in a monologue about nuclear waste during closed session.

Later Mr. Patten said: "We have absolutely no plans to deal with nuclear waste by using sea shafts. We have no intention of pursuing that option for the foreseeable future."

Officials said Britain did not wish to rule out the option when much might change in the next 50 years. Mr. Patten added: "It was a lively discussion and I wish people had been able to accept the compromise formula we proposed."

He pointed out that many of the nations which signed the declaration exported nuclear waste for disposal elsewhere. West Germany exports nuclear waste to Britain for reprocessing and low-level nuclear waste to East Germany for deep underground storage.