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8 August 1979

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

(FOUO 2/79)

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WORLDWIDE AFFAIRS

CANADA UNHAPPY OVER CANDU CANCELLATION BY JAPAN

OW071153 Tokyo MAINICHI DAILY NEWS in English 6 Jul 79 p 5 OW--FOR OFFICIAL USE ONLY

[Text] The Canadian Government is unhappy with the Atomic Energy Commission's expected decision to suspend the introduction of Candu reactors, according to informed sources. The sources said that Canada's dissatisfaction stems from the obscure reasons given for the suspension.

The AEC is expected to announce the suspension this week. In turn, the commission will call for commercialization of the domestically produced advanced thermal reactor (ATR).

Canadian Prime Minister Joe Clark, while in Tokyo for the recent Tokyo summit meeting, sounded out Prime Minister Masayoshi Ohira's intentions concerning the Candu. But Ohira refrained from making any firm commitments. This, perhaps, attests to the AEC's decision to suspend the introduction of the Canadian reactor.

If worse comes to worst in this matter, the sources said, the present harmonious economic relations between the two nations could be disrupted.

The main reason why the AEC decided to suspend the introduction are the unsolved problems concerning the disposal of spent fuel from the Canadian reactor. Japan could build reprocessing facilities of its own but Candu produces four times as much spent nuclear fuel as the current light water reactors. Such facilities would be gigantic and would cost a great deal of money.

More importantly, if Japan introduces the Candu, the ATR, though produced domestically, would be considered to be a case of application of Canadian nuclear technology under the Japan-Canada nuclear pact to be ratified at the next Diet session. This would give Canada complete control over the Japanese ATR and hamper the commercialization of reactors.

On the other hand, the Ministry of International Trade and Industry (MITI) and the semi-governmental Electric Power Development Co supported the introduction of the Candu. The two countries countered the AEC claim by saying that the reprocessing issue will not be resolved by the light water reactors. It is unreasonable to emphasize the Candu reactor when considering reprocessing facilities, they said.

Canada, MITI said, is a major supplier of natural resources, such as lumber, to Japan. Japan imports from that country about one-third of the natural uranium used by the power industry.

The suspension of the Candu's introduction may dampen not only the two nations' economic relations but also joint projects, including oil exploration in the Arctic.

MITI stressed that long-term diplomacy should be considered in settling the issue of the Candu's introduction.

CSO: 5100

INDIA

JAPANESE JOURNALISTS REPORT ON INDIAN NUCLEAR PROGRAM

Tokyo GENSHIRYOKU SANGYO SHIMBUN in Japanese 17 May 79 p 6

[Article by (Mitsuo Nagasawa), deputy chief, ASAHI SHIMBUN Science Department: "Indian Nuclear Development Following an Independent Line"]

[Excerpts] India is a developing country with a population of 650 million people. India has extremely great expectations of science and technology. India wants to use science and technology as a means to escape from poverty.

Recently, Mr Mitsuo Nagasawa, who is deputy chief of the science department at ASAHI SHIMBUN's Tokyo office, and two other journalists (chief of the science department Kimura and science department member Akahito Oka) spent from 18 March to 10 April visiting government and research entities in India at the invitation of the Indian Government, and gathering information on the state of scientific and technological development in India.

The following is the current state of India's development of atomic power as seen by Mr Mitsuo Nagasawa.

On 18 May 1974, India carried out an underground nuclear test "for peaceful purposes." When asked whether India would develop nuclear weapons in the future, India consistently and strongly denied that it would. P. N. Kurishnamatei, the director of the Baaba Atomic Energy Research Center, says, "It takes money to develop nuclear weapons. Furthermore, nuclear weapons are useless without missiles." This reporter interviewed Counsellor M. A. Berody who works directly on atomic energy matters for the Indian Ministry of Foreign Affairs in New Delhi. Mr Berody insisted that the underground test was for peaceful purposes.

Nevertheless, India has taken the position that India will not become a party to the Nuclear Non-Proliferation Treaty (NPT). Counsellor Barody gave India's reasons for this as follows: " It is because the treaty is not equitable. The United States and the Soviet Union are trying to restrain nuclear weapons

from proliferating horizontally to other countries, but America and Soviet vertical proliferation is even more terrifying. We are, of course, opposed to horizontal proliferation; but if we stop horizontal proliferation we should also stop vertical proliferation at the same time."

India has concentrated on one natural uranium-heavy water CANDU reactor with the idea of having a self-sufficient nuclear fuel cycle. At the Karupakamu Atomic Reactor Research Center, where India is developing a fast breeder test reactor (FBTR), the principal physicist G.Benkataraaman talked logically about India's course.

He said that the FBTR is under construction and the reactor core will go in after about 8 more months. The reactor will have mixed oxide fuel of 30 percent plutonium and 70 percent uranium which has been enriched 58 percent and will use thorium oxide in its blanket.

India has natural uranium and is operating a heavy water plant. It will run the CANDU reactor with this. Then plutonium will accumulate. India will extract this in India's own reprocessing plant and will use it in the FBTR. The blanket in the FBTR will be Thorium 232 extracted from sand in Kerala State. After this becomes Uranium 233 by absorbing neutrons it will be mixed with plutonium and used in the core of the FBTR as a substitute for enriched uranium. Finally, India will complete a breeder reactor which will use uranium 233 in its core and Thorium 232 as the blanket.

The Indian Uranium Corporation mines and refines uranium in Jadowaguda in Bihar State. The uranium is processed into fuel at the Nuclear Fuel Complex at Hyderbad in southern India.

Heavy water is processed at the Nangaru Plant in Punjab State, which began operating in 1962 and is capable of producing 14 tons annually. In addition, construction is under way on the Kota plant, which will produce 100 tons yearly, the Barooda Plant, which will produce 67.2 tons, and the Towachikorin Plant, which will produce 71.3 tons per year.

Reprocessing is already being done by the Tarapuru Plant, which reprocesses spent fuel from the Tarapuru and Rajasthan power stations. The Karupakamu Reprocessing Plant is under construction.

Prospecting for uranium and thorium is done by the Atomic Minerals Department of the Atomic Energy Ministry (headquartered in Hyderabad). The National Geophysical Research Institute (also in Hyderbad) also cooperates in this effort. The work of extracting thorium from the sands of the seacoast of Kerala State is done by the Indian Rare Earth Company.

Prior to completion of the FBTR, the Karupakamu Atomic Reactor Research Center has been working to master natrium. A 500-KW natrium loop is operating and an electromagnetic flow meter and a sodium ionization detector have been developed. High level facilities, such as an electron macroscope and a hotlab which will study irradiated materials have been provided.

While the thermal output of the FBTR will be relatively small at 450,000 KW, turbine generators have also been provided. Doctor Benkataraman said, "All at once we have built something so to speak, midway between the Rhapsody and the Phoenix." In the words of principal design engineer S.R. Haranjipe, "India has now completed the first stage of the nuclear fuel cycle."

Already, it is said, plans have been begun for a prototype 500,000-KW breeder reactor.

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CSO: 5100

JAPAN

LDP COMMITTEE URGES NUCLEAR POWER DEVELOPMENT

OW071013 Tokyo ASAHI EVENING NEWS in English 6 Jul 79 OW--FOR OFFICIAL USE ONLY

[Text] The ruling Liberal Democratic Party's commerce and industry committee worked out Thursday the "outline of an international trade and industry policy." The policy advocates putting the greatest emphasis on the development of nuclear power as the most reliable energy source other than oil. The outline includes measures which the LDP wants to be incorporated in the budget for fiscal 1980.

It points out the urgency of developing coal liquefaction techniques, nuclear power and other energy alternatives. It proposes the creation of (1) a special law to encourage the shift from petroleum to other energy sources; (2) an "alternative energy agency:" (3) a special tax to secure funds to expedite the changeover to other energy sources; and (4) a special account for the energy switch.

The outline also calls for a special budget framework for the next fiscal year to be prepared so that more appropriations can be secured for the energy policy. The main points are almost the same as those proposed by the Ministry of International Trade and Industry.

Although the outline says that care must be taken to ensure the safety of nuclear power generation, it declares that nuclear energy is the most reliable alternative for the time being. To encourage its development, it proposes: (1) the construction of a second spent nuclear fuel reprocessing plant and a model plant for extracting uranium from sea water so that a nuclear fuel cycle system can be created; (2) participation in the proposed international agreement to control plutonium; and (3) the faster development of new power-generation reactors.

To secure a stable oil supply, it advocates getting supplies of crude oil from a number of sources, expanding the development of overseas oil fields, increasing GG (government-to-government) oil deals and boosting the amount of state oil reserves from 10 million kiloliters to 30 million kiloliters.

CSO: 5100

JAPAN

HALF OF JAPANESE PUBLIC APPROVES OF NUCLEAR POWER

OW051436 Tokyo ASAHI EVENING NEWS in English 4 Jul 79 p 1 OW--FOR OFFICIAL USE ONLY

[Text] Half of the Japanese favor using nuclear power as a source of energy in the future, but they demand that priority should be given to safety, according to an opinion poll conducted by the ASAHI SHIMBUN.

The survey also showed that 82 percent of the people know about the Three Mile Island accident in the United States in March and 67 percent fear that a similar accident could happen in Japan. Nevertheless, more than 50 percent believe nuclear power can be made a safe energy source in the future if reliable technology and control systems are developed. The survey was conducted on June 12-13.

The majority of the people are still very anxious about the development of nuclear energy. Nearly 60 percent of the pollees said they feel fearful when they hear the word "nuclear power," but the survey shows that young people are beginning to favor nuclear power as an energy source.

Electricity generated by nuclear power stations now accounts for only about 10 percent of the total, about the same rate as for hydroelectricity. Less than 30 percent of the people polled think the rate is surprisingly low, and 60 percent do not think so.

Fifty percent approve nuclear development and 29 percent are opposed, but to the question "would you allow the construction of a nuclear power plant near your home?" only 18 percent replied "yes" and 67 percent answered "no."

The percentage of people against the use of nuclear energy was higher in the latest survey than in the previous poll last December. In the December poll, 55 percent favored nuclear power as a future energy source and 23 percent were against it. In the December survey, 23 percent said they would approve the building of a nuclear plant near their homes and 60 percent said they would oppose it. The Three Mile Island incident in March has apparently affected people's opinions.

Fifty-two percent believe nuclear power can be developed as a safe energy source, but 33 percent fear that nuclear power could pose uncontrollable dangers.

Asked what the government should do about the development of nuclear energy, 49 percent said that safety should be given priority and 29 percent demanded that all information about nuclear power be made public so that a national consensus can be formed. Only 13 percent thought that nuclear power is dangerous and its development should be totally abandoned, or that existing reactors should be shut down and checked for safety. And only five percent believe that nuclear power is the only future energy source and should be exploited.

CSO: 5100

JAPAN

MITI SEEKS SHARE IN NUCLEAR REPROCESSING COMPANY

OW/TK111035 Tokyo NIHON KOGYO SHIMBUN in Japanese 6 Jul 79 P 1 OW--FOR OFFICIAL USE ONLY

[Excerpts] According to what was revealed by a government source on the 5th, MITI has firmed up the policy of giving direct financial aid, such as government investments, for the plan to establish a company for the reprocessing of spent nuclear fuel, preparations for which company are being pushed so that it will be established in November.

In concrete terms, a "substitute energy new tax" will be established in the next fiscal year, and, with this as a revenue source, a "substitute energy special account" and a "substitute energy development public corporation" will be established. Investments by the public corporation or interest subsidies are being considered. Electric power industry circles are showing strong reluctance to this concept of MITI, saying that there is the fear that the leadership of the private reprocessing company will shift to the government side. It is likely that this will become one of the points of issue foretelling the outcome of MITI's over-all strategy on substitute energy.

As to the plan for establishing a private reprocessing company, preparations are being pushed, under the lead of electric power industry circles, by such related industry circles as electric machinery, industrial machinery, shipbuilding, construction, chemicals, trading companies, banks, and non-ferrous metals. On the 16th, a "new reprocessing company establishment preparatory committee" will be inaugurated, and Electricity Enterprise Federation Vice-Chairman Kenichi Masachika is scheduled to take the post of chairman.

According to the concept to date, the new company will be established in November this year, and a reprocessing plant with an annual processing amount of 1,500 tons will be constructed with a total investment of 500 yen billion, so that the operation of the plant will be started in 1990. Together with the existing reprocessing facilities (annual processing amount: 200 tons) of the power reactor and nuclear fuel development corporation. It is aimed at domestically processing all the spent nuclear fuel of Japan which is to be discharged in 1990. In promoting this plan, private circles say, "we want to receive a long-term, low-interest Development Bank loan as to 70 percent of the total amount of investments" (leader of electric power industry circles).

MITI was checking into direct financial aid in the form of investment or a large amount of interest subsidies. However, it judged that investment by the development bank is difficult because it requires a revision of the Development Bank law, and a direct investment by the "Substitute Energy Development Public Corporation" or the interest subsidy formula has been rapidly brought into the limelight.

MITI has worked out a substitute energy development over-all strategy, under the lead of the Resources and Energy Agency, with the establishment of the following new laws as pillars: a "substitute energy development introduction promotion temporary measures law," "substitute energy development introduction promotion tax law," "substitute energy development public corporation law,""and "substitute energy development introduction promotion measures special account law" (all tentative names). As to the reprocessing company, too, it is positioning it as "something to back up atomic power generation, which becomes the core of substitute energy for the present" (MITI leader). It wants to take the form of more direct government aid within the framework of this over-all strategy.

On the other hand, and private circles' side including the electric power industry circles are showing reluctance to the substitute energy over-all strategy itself, saying that "it will force a new burden on the energy-connected industries." Furthermore, it fears that the leadership of the reprocessing company will be lost due to the introduction of direct government funds. In regard to the substitute energy over-all strategy, oil industry circles are already firming up the attitude of opposing the new tax, saying that "it is pre-requisite to review the present oil tax system."

CSO: 5100

JAPAN

THE COMMISSION DECIDES AGAINST CANDU REACTORS

OW071151 Tokyo ASAHI EVENING NEWS in English 6 Jul 79 p 3 OW--FOR OFFICIAL USE ONLY

[Text] The Atomic Energy Commission Tuesday decided that it would make a formal decision not to introduce the Candu reactor on July 17, when its regular conference will be held.

The dommission explained that there was an adequate reason at this moment for introducing the Canadian-made reactor. The commission said, however, that it would consider introducing the reactor in the future.

One of the reasons for not introducing the reactor is that it would retard the development of the advanced thermal reactor (ATR). The commission was forced to make a decision on the issue in order to draw up a budget for 1980.

CSO: 5100

JAPAN

CANDU REJECTED AS INCONSISTENT WITH RECYCLING PROGRAM

Tokyo SANKEI SHIMBUN in Japanese 2 Jun 79 p 5

[Article by editorial committee member Ichiro Ishibashi: "Candu Reactor Will Not Be Introduced, Atomic Energy Commission Decision on Grounds It Would 'Violate Policy'"]

[Text] The Atomic Energy Commission (Science and Technology Agency Chief Kaneko, chairman) met on the 1st to discuss the question of procuring electricity generating reactor Candu of Canadian manufacture and decided to reject it. Reason: It is not in consonance with the country's basic policy of recycling nuclear waste. There is no consensus as yet whether to announce the formal decision before or after the advanced nations summit to be held at the end of the month.

Acquisition of the Candu which is a heavy water reactor using natural uranium was recommended by the Electric Power Development Company and the Ministry of International Trade and Industry [MITI]. Whether or not to purchase this item was discussed at an informal symposium conducted by the Atomic Energy Commission at the end of March and it was reported that ways had been greased for its importation. At that time, it was strongly rumored that it would be acquired on a trial basis.

But this country which lacks uranium resources has a basic policy the early development of nuclear fuel recycling process, and the acquisition of the Candu reactor which is not designed for recycling is not in consonance with that policy. Construction of a plant to recycle nuclear waste from the Candu is impractical because there is four times as much spent fuel from the Candu as from other reactors. This was an added factor leading to the rejection.

Simultaneously, as an aftermath of nuclear accidents in the United States, the feeling is growing that Japan should enhance its own developmental efforts instead of depending on the acquisition of foreign reactors. The latest decision was reached after listening to experts in the field and in financial circles.

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CSO: 5100

MAY POLL REPORTS ATTITUDES ON ENERGY PROBLEM

OW141157 Tokyo THE DAILY YOMIURI in English 12 Jun 79 p 2 OW--FOR OFFICIAL USE ONLY

[Excerpts] Nearly 80 percent of the Japanese people are worried about oil shortages but only 64.8 percent of them are doing something to save energy, according to a poll conducted by the YOMIURI SHIMBUN on May 26 and 27. The poll also revealed that about 70 percent of the pollees are concerned about the dangers involved operating nuclear power plants.

The survey was taken against the background of a grave energy crisis which was brought about by oil shortages resulting from the political turmoil in Iran and the recent nuclear accident at Three Mile Island in the U.S.

The energy situation has worsened in recent months partly because the Three Mile Island accident, which was described as "America's worst nuclear emergency," has led many people to have reservations about the use of nuclear power as a substitute energy source. The accident was followed by stepped-up antinuclear power protests in the U.S. and other countries.

Exactly 78.2 percent of the pollees said "yes" to the question: "Are you worried about the current and future oil supply situation?" Nearly half--43 percent--of these pollees said that "critical energy shortages will occur soon." Another 38 percent said that "tight energy supplies will drive up commodity prices."

"The 1973 oil crisis, which triggered price spirals, is still vivid in the minds of the Japanese people," one pollster said. The government should develop and carry out energy policies that include measures to keep the people well informed on the energy situation, to expand the crude oil imports and to curb commodity price increases. Such measures are necessary to ease the energy situation in Japan and to eliminate anxiety about oil shortages."

The latest poll also showed that only 64 percent of those surveyed were responding to the government's plea for energy conservation and its slogan "saving energy starts with something as commonplace as turning off all the lights at home when they are not needed." Exactly 43 percent of these pollees said that they were cutting down on the use of the air-conditioning system at their homes.

Only 17 percent said that they were "trying to keep my car at home as much as possible to save gasoline."

"The government's holiday gasoline station closing plan also is not working well," the pollsters said. "This would seem to suggest that no voluntary guideline on energy conservation is very effective, unless it is turned into mandatory control."

The government is already working to expand the use of nuclear power, coal and liquefied natural gas as substitute energy sources. Electricity generated at nuclear power stations in Japan accounts for nearly seven percent of all electric power consumed in the country.

But the YOMIURI SHIMBUN poll showed that there was "widespread and deep-rooted fear" about the safety of nuclear power stations among the Japanese people.

Exactly 17.8 percent of those surveyed said that they were "worried very much" about the safety problems involved in the operation of nuclear power plants. Another 54 percent said that they were "somewhat worried" about this matter.

Pollsters noted, however, that 61 percent of the pollees gave cautious support to the government's policy of using nuclear power. These pollees said that nuclear power plants should be kept in operation but "the government should keep the operation to the minimum and answer all safety questions involved." Another 14 percent of those surveyed said that the government should act positively to increase the number of nuclear power stations in the country.

But nearly 60 percent of the pollees said that they would oppose any proposal to build a nuclear power station in their own districts. Only six percent of the people covered by a Prime Minister's Office survey last March gave this answer.

Pollsters who conducted the YOMIURI SHIMBUN survey explained that the Japanese people's antipathy toward nuclear power apparently increased after the Three Mile Island nuclear power plant accident that resulted in the shutdown of nuclear reactors at the plant.

CSO: 5100

BRIEFS

CFRP CENTRIFUGE--The Power Reactor and Nuclear Fuel Development Corp on 13 Jun 79 announced that it would start operating tests on a CFRP "jumbo centrifuge" of a form very close to the ultimate goal this summer. The "jumbo" has a diameter of 350 to 500 mm, heighth 5 to 10 m, peripheral velocity of 600 to 700 m/sec, and a yearly separative capacity of 10 to 100 kg SWU. There will be considerable debate on technical questions such as safety upon breakdown, equipment reliability, and materials cost as well as on advisibility of rendering metal centrifuge technology obsolete. Prospects of practicality are less than for the metal centrifuge program at present, and the level of funding and development schedule will be the critical factors determining the fate of the jumbo. [Tokyo NIKKEI SANGYO SHIMBUN in Japanese 14 Jun 79 p 13]

HEAVY WATER TECHNOLOGY--The Institute of Physical and Chemical Research, under contract with the Power Reactor and Nuclear Fuel Development Corp, has established good prospects for a water-hydrogen conversion process to remove tritium from heavy water that may be applicable for mass production of heavy water itself. The process takes advantage of the difference in equilibrium states of tritium water and tritium gas in duterium gas, and in principle analogous use of the difference in equilibrium states of water and duterium gas in hydrogen gas could be used for producing heavy water. [Tokyo NIKKEI SANGYO SHIMBUN in Japanese 19 Jun 79 p 13]

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OTHER SOURCES TAPPED FOR NUCLEAR POWER

London THE MIDDLE EAST in English Jul 79 p 93

[Text] Recent unconfirmed reports that Iraq has agreed to buy plutonium from Brazil suggest that the sabotage of the 70 MW Osirak research reactor being built in France for its new nuclear research centre has done little to deter the authorities in Baghdad from continuing with their nuclear programme.

The destruction of the Osirak reactor core by a skilfully placed bomb just before it was to be shipped to Iraq has generally been attributed to Mossad (Israeli intelligence), but informed observers do not rule out the possibility that ultimate responsibility lies with the US Central Intelligence Agency (CIA), whether or not Mossad was directly involved.

Washington has become increasingly concerned as control of nuclear power slips out of the hands of the major powers, largely as a result of their need to export to survive.

France and West Germany in particular have seemed to be more concerned with landing export orders than with preventing the spread of atomic weapons. France, for instance, agreed to sell Pakistan a reprocessing facility in 1978, but US pressure and its virtual monopoly over the supply of enriched uranium "persuaded" France to go back on the deal.

West Germany, on the other hand, which is less vulnerable because it has some enrichment facilities of its own, refused to bow to US pressure and is going ahead with the sale of a reprocessing plant and enrichment facility to Brazil and possibly a heavy-water plant to Argentina. This will make both Argentina and Brazil independent nuclear powers and will speed their development as nuclear exporters.

If work on the Brazilian plants goes according to plan, it should be in a position to export plutonium by the late 1980s, provided it can evade or get around application of the International Atomic Energy Agency (IAEA) safeguards to which it has agreed. Brazil will certainly need to export nuclear technology and material if the initial investment in the $13bn plants being built by Kraftwerk Union is to make economic sense.

Iraq's interest in becoming a customer for Brazilian nuclear technology is no secret. Brazil is now importing about 13-15mn tons of Iraqi crude oil a year, which represents around 12 percent of Iraq's output in 1978 and close to one third of Brazil's total oil imports.

Aware of the value of Iraqi oil supplies to major customers, such as Brazil, France, Italy, Spain and Japan, during the present world oil shortages, Iraqi Vice-President Saddam Hussain recently made it known that his Government was intending to charge what he called a "strategic price" for these supplies. France and Spain are consequently expected to reciprocate Iraq's readiness to enter into oil contracts by providing arms. Brazil, for its part, is apparently expected to provide plutonium.

It is difficult to see, however, exactly why Iraq should need plutonium if its nuclear programme is purely for the generation of electricity. There are only two uses for plutonium at present--as fuel for fast-breeder nuclear reactors (FBRs) or as material for atomic weapons. Even in the West FBRs are not yet in commercial use.

Iraq's nuclear programme began in the 1960s and it has had a small Soviet IRT-2000 research reactor in operation at the Tuwaitha Institute since 1968. Soviet reactors are stringently controlled and can be used only for their intended purpose, but it undoubtedly provided a useful training ground for Iraqi scientists.

More recently, Iraq has set up a new centre with French help, which would have been completed with the delivery of the Osirak. It is also negotiating with the French firm Framatome for the supply of a 600 MW power reactor.

Iraq has signed and ratified the Non-Proliferation Treaty (NPT), which means that it has undertaken not to develop nuclear weapons. Nevertheless, the Osirak would have been quite capable of producing enough plutonium for several bombs a year and the report of the deal with Brazil coming so soon after the sabotage of Osirak is viewed by many as more than just coincidence.

There is no doubt that, as long as Israel refuses to sign the NPT and as long as reports of the existence of an Israeli atomic bomb persist, the Arab states will feel compelled to redress this imbalance of power.

CSO: 5100

NIGER

URANIUM MINING SEEN AS KEY TO OVERALL DEVELOPMENT

Mining Economy: Essential

Paris MARCHES TROPICAUX ET MEDITERRANEENS in French 1 Jun 79 pp 1430-1435

[Excerpts] Whenever Niger is mentioned, one immediately thinks of uranium production. This is an understandable reflex insofar as the mining of the Air region uranium ores now provides over two-thirds of Niger's exports and supplies the government with a substantial portion of its annual hard currency income. However, it should be noted that despite the overwhelming and practically unique position that uranium occupies in Niger's mining picture, it is but one of the many resources contained in the country's subsoil.

The presence of phosphates no longer has to be demonstrated. In the so-called "W" region, enormous quantities of the ore have been discovered. According to ONAREM [National Office of Mining Resources], in the explored area alone -- which makes up only 5 to 6 percent of the prospecting zone -- it is estimated that workable reserves total several hundred millions of tons. Starting next year, coal will be extracted from the Anou-Araren mines (5 million tons confirmed). Good quality iron ore (51 to 53 percent) is abundant in the Say region (650 million tons) and its mining can be anticipated during the next 5 years. Regarding oil, which was discussed at length in a previous chapter, hopes are very good. Cassiterite (tin ore) has been mined for a very long time, but on a small scale. The same is true of salt and natron. In addition, Niger has gold, copper, bauxite, manganese and molybdenum in rather large quantities. These resources do not all appear to be usable, at least in the immediate future, but it must be emphasized that to date, only 11 to 12 percent of the territory has been prospected in a rational manner. Research continues and hopes are quite high.

Uranium: Only Resource of Subsoil Now Worked

Uranium is the driving force of Niger's economy and the essential element the country's development. Hard currency resources obtained by uranate exports have increased considerably in the course of recent years. They represent several tens of billions of CFA francs annually and have enabled

Niger to devote some 14 billion CFA francs to the National Investment Fund in 1978 and nearly 22 billion for the 1978-1979 fiscal year, compared with the 2.5 billion CFA francs which the Fund had in 1974.

Consequently, Niger is able -- without yet giving up international financial support -- to contribute to the expansion of its economic possibilities and the establishment, in the most diverse domains, of infrastructures indispensable for development.

It has been thought, stated and sometimes written that while the Niger Government derived an enormous profit from the working of uranium ores, the life of the "average Nigerien" had not yet been substantially affected. This opinion, which is shortsighted and essentially based on the fact that the Air operations now employ only a few thousand individuals -- generally jobbers who cannot therefore demand astronomical wages -- is absolutely erroneous.

Uranium and the Minimum Income Tax

In general, it could be emphasized that in a country whose administration is sound -- and Niger undeniably fits into this category -- the nation's interests go hand in hand with the interests of each citizen. But such a philosophical argument is not automatically accessible to the masses, which prefer concrete data to reasoning.

Among such data is at least one factor which has not escaped the Niger population, particularly its more modest representatives. It is the outright elimination of the so-called IMF tax (minimum income tax). This tax was levied on all Niger citizens, whether they lived in opulence or poverty. After a year of work and savings, the poorest peasants or shepherds could not manage to free themselves from the tax collector and lived in constant fear of the annoyances or cruelty inflicted by the "redcaps."

This constant concern is now spared them because uranium, about which most know nothing, has made it possible to make up the 1 billion CFA francs of which the Treasury is deprived due to the elimination of the inappropriate tax.

As an individual, the Nigerien does not always deprive an immediate profit from public investments, the vast majority of which are financed by uranium, but mothers whose children attend the more numerous and better equipped schools, sick people who are cared for at clinics or in more comfortable hospitals, farmers who receive fertilizers or phytosanitary products at prices far below those found on the regular market, consumers who are lucky enough to obtain Thai rice at half of its cost price from the OPVN [Niger Foodstuffs Office], and so on, essentially owe these things to the fact that receipts from uranium enable the government to meet expenditures arising out of these social facilities or price reductions.

It is superfluous to add that work underway in the area of communications infrastructures (uranium road) or energy infrastructures (Anou-Araren powerplant) and to whose financing the uranium mining enterprises make a substantial, direct contribution, already has a marked effect on employment and within the next few years to come will profoundly modify the socioeconomic context in areas involved.

Existing Resources and Workable Resources

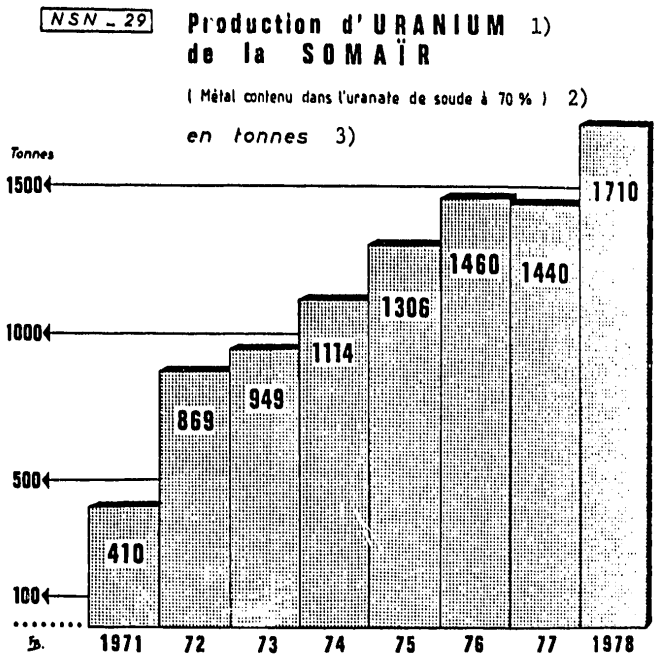
No matter how abundant they might be, not all the mining resources could contribute to the country's development. It is good to repeat that Niger is a landlocked country and its territory closest to the sea is some 800 kilometers from the coast. Consequently, the country can only work its resources -- particularly its mining resources, which are generally heavy and whose value-weight ratio is low -- if it can deliver them to a maritime port at a competitive price. One can therefore understand why the working of iron ore, aluminum or phosphates -- even if low in quality -- is always possible and almost always profitable when the deposits are found near the sea and do not require costly means of shipping. On the other hand, very large deposits with high-quality ore can only be considered as potential resources, due to their distance from the sea, when suppliers that are more favorably situated geographically speaking can meet the demand at better prices.

On the local level, basic processing possibilities for the common ores mined in the country are extremely limited. Iron ore can be pelletized, phosphate can be enriched and bauxite can even be turned into alumina, as is done in Guinea. However, these operations, which already require substantial investments, are inadequate. They can double, triple or quadruple the per-kilogram worth of the workable ore through the elimination of heavy elements of no value. However, even if the product obtained is upgraded, the price-volume ratio is relatively low and therefore, in order to obtain an appreciable turnover, it would be necessary to ship tons of thousands of tons toward the sea over thousands of kilometers. Furthermore, in the case of a landlocked country, this would have to be done through a foreign country.

Very High Value-Weight Coefficient

Uranium would not escape this rule if it were necessary to export the unprocessed ore, which at the SOMAIR [Air Region Mining Company] quarries contains no more than 3 kilograms of metal per ton (between 2.5 and 3 percent). As the crow flies, Niger's deposits are 1,500 kilometers from the nearest Libyan coast or the shores of the Atlantic (Lagos)...and there are no access roads. The production which SOMAIR exported in 1977 alone (1,120 tons of metal contained) would have required the shipping of some 400,000 tons of unprocessed ore.

Fortunately, the Air region's mining operations have remarkably well-equipped industrial complexes that process the ore and turn it into uranate containing some 70 percent metal.



Key:
1. SOMAIR's Uranium Production
2. Metal contained in 70-percent sodium uranate
3. In tons

Since uranium is a rare and expensive metal, 70-percent uranate has a very high value-weight coefficient: 23,000 to 25,000 CFA francs per kilogram, FOB Cotonou, in 1978. One can easily understand why, under such circumstances, the effect of transport costs, without being negligible, is infinitely smaller on a ton or uranate than on a ton of phosphate, alumina or pelletized iron ore and why, in the absence of any other solution, one might even considering shipping it out by plane. Actually, SOMAIR's uranate, along with that of COMINAK [Akouta Mining Company], is shipped to Cotonou by road and rail. With respect to road transport, a few dozen shifts of two or three 20-ton trucks would be enough to haul the annual production of the two enterprises.

Uranate is practically the only Niger product for which the country's landlocked nature is not an insurmountable obstacle, although supplying the

mine and the plant with very heavy products (50,000 tons of hydrocarbons, sulfur, soda, materials and some rolling stock transported in 1977 over 2,000 kilometers by road and rail for SOMAIR alone) is particularly costly.

CEA Studies and Establishment of SOMAIR

The discovery of uranium in Niger took place a relatively long time ago. A year before independence, in 1959, the French Atomic Energy Commission (CEA) began to study deposits discovered in the Air region. The studies continued until the end of 1966 and in 1967, the reports drawn up by the research workers showed that it was possible to work the confirmed reserves at a profit. The reserves were then estimated to contain some 20,000 to 25,000 tons of uranium metal, which meant that one could anticipate 15 years of mining with an average annual production of 2,100 to 2,200 tons of uranate.

On 1 February 1968, the Air Region Mining Company (SOMAIR) was set up and given the task of working the reserves on a concession of 360 square kilometers granted to the CEA in the Arlit region. Work indispensable for putting the mine and then the plant into operation had to be undertaken without delay. Naturally, the work was particularly costly, representing over 15 billion CFA francs (1968 value).

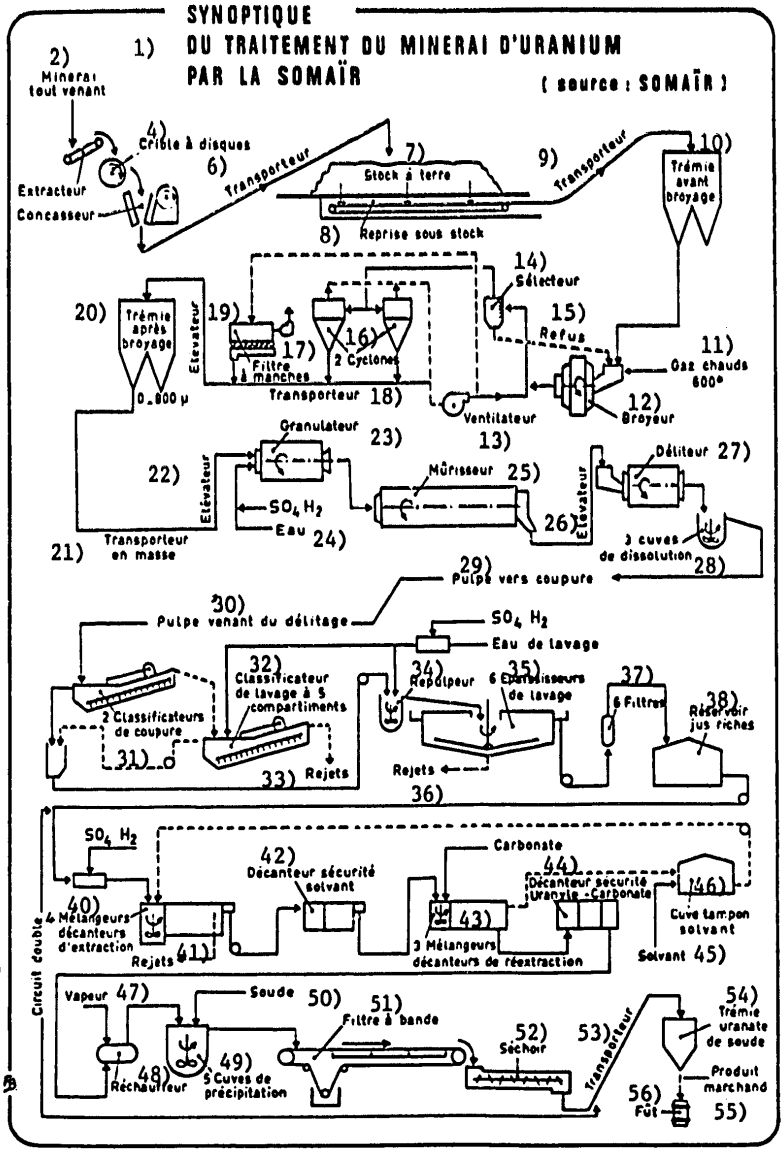
With respect to mining, the discovery of the first quarry, called Arlette (the other two, mined later, are named Ariege and Artois), meant 1.5 million cubic meters of earthwork because the ore was at a depth of 35 meters. Powerful stripping and loading machines went into operation, along with a fleet of heavy trucks (30 tons), which had to carry out over 100,000 operations.

The first temporary slab housing for workers was gradually replaced by more modern housing and social facilities that could be adapted to needs. The first city of Arlit, which suddenly emerged from the sand, had some 5,000 inhabitants at the time. It now has 12,000.

The problems of water for technical and human needs were acute because Arlit is right in the desert. They were solved by the drilling of fairly deep wells: the Tarat Madaouela watersheet (40 to 50 meters); the Guezouman watersheet (90 to 100 meters); the Vizeen watersheet (some 500 meters). At the present time, the plant and the city have sufficient water, but some underground water supplies may run out and their use by new mining companies set up recently or being set up may accelerate the process and make it necessary to prospect for water again.

Very Modern Processing Plant

Finally, the ore processing plant had to be built. Its size and modern construction still surprise visitors today. It is not necessary here to go into the complex physical or chemical operations that take place at that industrial facility. The drawing below will enable readers to follow the different phases, which can be summed up as follows:



[Key on following page]

[Diagram on preceding page]

Key:

1. Diagram of SOMAIR Uranium Ore Processing
2. Unprocessed ore
3. Extractor
4. Disc screen
5. Crusher
6. Conveyor
7. Stock on ground
8. Pickup under stock
9. Conveyor
10. Pregrinding hopper
11. Hot gas
12. Grinder
13. Ventilator
14. Selector
15. Tailings
16. Rotating cylinders
17. Ventilating filter
18. Conveyor
19. Elevator
20. Postgrinding hopper
21. Mass conveyor
22. Elevator
23. Granulator
24. Water
25. Roaster
26. Elevator
27. Slaker
28. Three dissolving tanks
29. Pulp to classifiers
30. Pulp from slaker
31. Two size classifiers
32. Five-compartment washing classifier
33. Tailings
34. Repulper
35. Six-layer washing
36. Tailings
37. Filters
38. Pregnant leach liquors
39. Double circuit
40. Extraction mixers and decanters
41. Tailings
42. Safety decanter
    Solvent
43. Three mixers
    Re-extraction decanters
44. Safety decanter
    Uranite-Carbonate
45. Solvent
46. Buffer tank
    Solvent
47. Steam
48. Reheater
49. Precipitation tanks
50. Soda
51. Belt filter
52. Drier
53. Conveyor
54. Sodium uranate hopper
55. Commercial product
56. Drum

Ore having a satisfactory uranium content is screened, crushed and taken by conveyor belt to a storage area, where it is picked up again and carried to self-generating hot, dry pulverizing facilities that reduce it to fine powder (800 microns). This powder is brought into contact with sulfuric acid and water (70 kilograms of acid, yielding, with the water, 80 to 110 liters of liquid per dry ton) in a rotating pipe and then a large cylinder, where the reaction takes place over a period of 2 to 3 hours at a temperature of 80° to 90° C. (roasting). The product of the operation is slaked in water and the solid elements are removed. One now has a uranite sulfate solution which a bank of mixers and decanters purify (solution of tertiary amine in kerosene) before it is brought into contact with sodium carbonate. This last operation results in an intermediate product, carbonated uranite, which an addition of soda causes to precipitate. It is this sodium uranate precipitate, yellow orange in color (yellow cake), that is dried, weighed and then placed in drums. It contains between 68 and 71 percent of uranium metal.

The SOMAIR plant, built in 18 months by Ugine-Kuhlmann and the CEA (with the Technical Chemical Enterprises Company (STEC), a subsidiary of Ugine-Kuhlmann, in charge of the engineering), had an initial production capacity of 750 tons of contained metal per year. Its capacity was doubled in 1973. Another expansion is underway: 2,000 tons of contained metal per year beginning in 1981.

Processing of Low-Grade Ore

Not all the ore taken from the quarries is processed at the plant. Ore with too low of a metal content is subjected to a leaching process. This operation consists of piling up 100,000 tons of ore -- with each pile covering about a hectare -- on plastic frames. This uncrushed raw material is then sprinkled with sulfuric acid mixed with water. The acid solution works slowly, over a period of months, and uranite sulfate is recovered from the piled ore and then processed at the plant, as seen above. It is turned into carbonated uranite and then into sodium uranate.

All the mining, urban and industrial operations were completed in 1970. The mine became operational during the second half of that same year and the plant started up in November 1970. On 11 January 1971, the first yellow cake of sodium uranate was produced, immediately dried and placed in drums, then taken by truck in February 1971 to the Cotonou port.

SOMAIR's Evolution

Since that time, SOMAIR has undergone profound changes and the Niger uranium sector has expanded greatly. When it was set up, SOMAIR had a capital of 2.7 billion CFA francs, distributed as follows: the Republic of Niger, 20 percent; the French Atomic Energy Commission, 40 percent; the Pechiney-Mokta Mining Company, 20 percent; and the French Uranium Ore Company (CFMA), 20 percent.

In February 1970, with the consent of the Niger Government, the company increased its capital from 2.7 billion CFA francs to 3,223,880,000 CFA francs and took in two new partners: Urangesellschaft mbH of Germany and AGIP [Italian National Oil Company] Nucleare spA. The distribution of shares was then as follows: the Republic of Niger, 16.75 percent; the CEA, 33.5 percent; Pechiney-Mokta and the French Uranium Ore Company, 33.5 percent; Urangesellschaft, 8.215 percent; and AGIP Nucleare, 8.215 percent.

In 1973, SOMAIR took out two loans from the Central Fund for Economic Cooperation (CCCE) and the Rhodafin Company. They amounted to 2.66 billion CFA francs and were backed by the Niger Government (22 March 1973). SOMAIR decided to use the credits to expand the capacity of its plant (from 750 to 1,500 tons of contained uranium). The STEC carried out this expansion operation. SOMAIR's capital rose to 3.5 billion CFA francs through an increase in capital and the distribution of shares among its partners.

In 1974, the change in regimes did not result in the nationalization that some had feared, but the government's mining policy was modified and on 19 December 1974, the National Uranium Research, Mining and Marketing Office of Niger was set up, followed by the establishment, in January 1975, of the Mining Exploration and Exploitation Office (BUREMI). By the end of 1974, negotiations had been undertaken aimed at increasing Niger's share of SOMAIR's capital.

In 1975, its capital was increased from 3.5 billion to 4,348,000,000 CFA francs through the creation of 169,777 new shares worth 5,000 CFA francs each, sold to URANIGER [presumably Niger Uranium Company], a national firm. Niger's participation thus amounted to 33 percent.

In 1976, the CEA set up a subsidiary in Niger: the General Nuclear Materials Company-Mining Research Firm of Niger (COGEMA-GAM-Niger) and a year later, was to transfer its rights and obligations to the company, which thereby took the place of the French Atomic Energy Commission in holding SOMAIR stock.

In August 1976, the National Mining Research [sic] Office of Niger (ONAREM) was set up to take the place of the two previously existing national organizations: URANIGER (already mentioned) and OFREMIG [expansion unknown] (a research firm). It was to represent the Niger Government in all sectors of research and the working and marketing of mining products, especially uranium. ONAREM, a 100-percent national company, therefore represented the Republic of Niger in SOMAIR's capital.

Also in 1976, the Pechiney-Mokta Mining Company, which held 15.165 percent of the SOMAIR stock, turned over its shares to the Mokta Company and MINATOME [expansion unknown].

Uranium Metal

Since that time, SOMAIR's capital, which totals 4,348,885,000 CFA francs, has been distributed in the following fashion (in percent):

ONAREM	33
COGEMA	26.961
French Uranium Ore Company	11.796
MINATOME	7.583
Mokta Company	7.582
Urangesellschaft	6.539
AGIP Nucleare	6.539

Until August 1978, the Air Region Mining Company was the only Nigerien enterprise that produced uranium. From 1970 until the beginning of 1979, it mined some 57 million tons of materials from its quarries, including 44 million tons of "dead soil" (unusable elements), and 13 million tons of ore whose metal content varied. Between 1971, the first year of production, and the end of 1978, it obtained some 13,250 tons of sodium uranate containing 9,258 tons of uranium metal, or (in tons of uranium metal):

1971	410
1972	869
1973	949
1974	1,114
1975	1,306
1976	1,460
1977	1,440
1978	1,710

Akouta Mining Company

Since August 1978, a second Nigerien mining company has been producing magnesium uranate: the Akouta Mining Company (COMINAK).

The constitutive assembly of the company was held on 12 February 1974 in Niamey. The initial capital of 3.5 billion CFA francs was divided among the Republic of Niger (31 percent), the CEA (44 percent), and the Japanese consortium Overseas Uranium Resources Development (OURD) (25 percent). Shortly thereafter, the CEA turned 22.7 percent of its own shares over to the Spanish firm ENUSA (National Uranium Enterprise), which therefore gained 10 percent of COMINAK's shares, with CEA retaining 34 percent.

Its capital has remained unchanged, but the 31 percent of the Republic of Niger is held by ONAREM, representing the government, and the 34 percent of the CEA is held by COGEMA, which for several years has been the CEA's operating subsidiary.

COMINAK is developing a uranium deposit discovered by the CEA at Akouta, near (10 kilometers west) the Arlit deposit being worked by SOMAIR. The

company faced problems somewhat different from those encountered by SOMAIR. The useful ore is at a depth of some 250 meters. In order to have access to it, there could therefore be no question of undertaking gigantic quarry operations. Rather, the mining is done through a system of galleries. It was necessary to install elevator systems for personnel and materials, with the latter being summarily crushed before being subjected to finer grinding at the mine quarry.

The processing plant, which has a capacity of 2,200 tons of uranium metal per year, operates according to a principle nearly analogous to that of the SOMAIR plant, but in the final phase, soda is replaced by magnesium. The product obtained is 70-percent magnesium uranate. It should be emphasized that COMINAK's ore, which is slightly richer in uranium than that of SOMAIR, also contains a considerable proportion of molybdenum, which can be extracted by solvents at the firm's processing plant.

COMINAK therefore had to set up a new city for its personnel: Akokan. The city planners in charge of its development had the remarkable precedent of the pilot city of Arlit and made certain modifications which experience had shown to be advisable.

Startup of Production in August 1978

Japanese participation in the company was foreseeable as early as 1969. At the end of that year, the Japanese Council for the Nuclear Energy Industry had expressed a desire to cooperate with France in the working of uranium deposits in Niger and for that purpose, contacted the CEA.

In December 1974, the Central Fund for Economic Cooperation (CCCE) paid COMINAK 2,275,000 French francs (113.8 million CFA francs) for participation and in 1975, granted it a loan of 230 million CFA francs.

In April 1976, the JOURNAL OFFICIEL of Niger published the text of two orders, the first giving the government's guarantee for a bank loan of 4 billion CFA francs obtained by COMINAK and the second authorizing URANIGER to borrow 1.09 billion CFA francs from the CCCE in order to participate in COMINAK's financing. In November 1977, the CCCE granted the latter company a loan of 1,085,000,000 CFA francs.

COMINAK, working a deposit whose reserves contain an estimated 40,000 tons of metal, began its production of uranate in August 1978. By the end of February 1979, it had already produced 600 tons of contained metal. In the course of 1979, it should reach the level of 1,750 tons and then level off at around 2,000 tons per year.

Seven Major Projects: Immouraren, Djado, Azelik

While SOMAIR and COMINAK are the first two Nigerien companies to have producdd uranate, they are far from being the only ones interested in uranium.

Seven or eight other companies or consulting firms are working on signs or deposits whose total likely reserves seem to exceed 120,000 tons of metal (in addition to those of SOMAIR and COMINAK).

The largest of these deposits is Immouraren. It reportedly contains 70,000 tons of uranium metal. A partnership was set up in 1974 including the Republic of Niger (now represented by ONAREM), 30 percent; the CEA (now COGEMA), 35 percent; and the American company Conoco, 35 percent. Its purpose was to study the project aimed at working the enormous deposit. COGEMA and Conoco have already devoted over 3 billion CFA francs in investments to this feasibility study, which is practically finished. Preparations may be quite rapid. Mining, mainly done by means of galleries since the deposit is at a depth of 120 meters, could start toward the end of 1981 and the first uranate could be exported in 1982. The figure of 2,500 tons of production per year (contained metal) is generally given as an average.

On 14 May 1974, the Djado Mining Company was set up in Niamey. The initial partners were Niger, the French Atomic Energy Commission and the German company Urangesellschaft, which were to be joined by the Japanese Power Nuclear Fuel Development Corporation (PNC). At the present time, the shares are distributed as follows: ONAREM, 25 percent; COGEMA, 25 percent; Urangesellschaft, 25 percent; and the PNC, 25 percent.

The first objective of the Djado Mining Company consists of verifying the importance of the uranium signs discovered in 1970 by the CEA in the Djado area. The field of experimentation involves 100,000 square kilometers. In the course of the second phase, if the verifications should be positive, the company is to study the possibilities of working the tested and estimated deposits on a profitable basis. Over 2.5 billion CFA francs have already been devoted to research.

In 1975, a partnership including the Republic of Niger (now ONAREM), 50 percent, and the Japan Petroleum Trading Company (JPTC, now IRSA [expansion unknown]), 50 percent, was created to study the working of a deposit known to exist since 1959 and apparently containing 5,500 to 6,000 tons of uranium metal. The ore is carbonated (like that of Madaouela, to be discussed below), while that of Arlit or Akouta is oxidized. Feasibility studies are underway and should take over 2 billion francs in investments. No date can be given for future mining (at least one mine, at Azelik).

In-Adrar, Tassa N'Taghalgue, Afasto-Ouest, Tchelit

Contiguous to the JPTC-IRSA permit (10,000 square kilometers in the Azelik region) is the In-Adrar zone where surface traces of uranium ores were discovered as early as 1959. A partnership made up of ONAREM (33 percent), COGEMA (26 percent) and the Iranian Atomic Energy Organization (OEAI), along with AGIP Nucleare, decided to devote 5 billion CFA francs in investments toward the drafting of a project to work the reserves, whose size has not yet been determined. Work on the project will undoubtedly not begin before 1986 or 1987.

A project for the nearer future (1981) will involve the Tassa N'Taghalgue deposit, which is near Arlit (4 kilometers) on a concession granted to the CEA in 1968. The deposit's reserves have been estimated at 20,000 tons of metal contained. A mining company in which ONAREM and COGEMA will each hold 50 percent of the shares is being set up to work the deposit. The features of the deposit and the proximity to the Arlit processing facilities lead one to think that the Tassa ore will be extracted and processed some months before that of Immouraren.

Two other deposits are rather close to Arlit: the Tcheli and the Afasto-Ouest deposits. They are contiguous and each have special problems. The first (Tcheli), on the Afasto-Ouest land, involves an area of 2,000 square kilometers in the Madaouela zone. It has been known since 1964 and its reserves are an estimated 6,500 tons of metal. However, the ore, like that of Azelik, is carbonated, which implies different processing from that used for oxidized ores.

Naturally, the deposit does offer guarantees of profitability and a consortium being formed -- including ONAREM (30 percent), the Niger Government (16 percent), the English firm CEGB [expansion unknown] (12 percent) and the French company Interplan (12 percent) -- plans to work it by 1985 (an estimated 1.5 billion CFA francs in investments).

Afasto-Ouest's problem is the depth of the ore: some 600 meters, but the reserves are quite sizable -- although not yet precisely estimated -- and a partnership made up of ONAREM (33.33 percent) and COGEMA (33.33 percent) along with the Japanese company OURD (33.33 percent) believes that it will be able to operate one or several mines in the area (1,800 square kilometers).

Over 200,000 Tons of Uranium Metal

Uranium reserves now being worked or soon to be worked (within the next 10 years) may represent 200,000 tons of uranium metal, which corresponds to some 6.9 trillian CFA francs in payments, 1978 FOB value. Niger does not yet have such a gold mine, but by 1979, the joint contributions of SOMAIR and COMINAK should ensure the country of over 80 billion CFA francs in gross payments compared with only 20.6 billion in 1976. Growth will continue with the startup of Tassa, Immouraren, Afasto-Ouest, In-Adrar, and so on. This is sufficient to show the scope of possibilities available to Niger on the path to development.

In Niamey, a monument may one day be raised to this rare metal that was practically unknown before the work of Pierre and Marie Curie and before their discovery of radium brought the spotlight of current events to bear on radioactive elements. We may undoubtedly regret the fact that in the past, harmful use was made of these elements whose extraordinary power man, in his limited knowledge, has not yet mastered. However, it will be thanks to man also that Niger will be able to derive a profit from abundant mining resources of a lower metal content which Niger's current landlocked nature -- which uranium will make it possible to bring to an end -- rendered unprofitable.

The "uranium road" discussed at length in a previous chapter is already being called upon to end the isolation of the central and northern regions of the country once and for all. For the most part, construction of the road is being directly financed by seven mining companies making up Concerta.

This is only a beginning. Operations aimed at gaining access to the sea will be undertaken at once and uranium will contribute to their financing. In this way, Niger's phosphates, iron and other ore reserves will be able to be mined because their transport will no longer face the current difficulties.

Importance of 'Uranium Road'

Paris MARCHES TROPICAUX ET MEDITERRANEENS in French 1 Jun 79 pp 1406-1407

[Excerpt] The "uranium road" actually constitutes an exceptional element of development in a vast desert or semi-desert region which, if it were not for the road's existence, would have been abandoned long ago. Life begins at the beginning of a road. The shipment of uranium from the Air region and the hauling of raw materials and energy products used in its mining and processing make an exceptionally well-designed road through central Niger both possible and profitable. The Tamaya, In-Gall, Gabos and Tiguidit oases and the city of Agadez will thus emerge from their isolation, when the choice of a route to the north would not have altered their traditional solitude.

Building a 700-kilometer-long road through a desert region is obviously costly, but the development of the production of the Air mines, the hopes to which it gives rise, the country's calm and serious attitude, the strictness of its administration and the confidence it inspires in the world have made it possible to mobilize financing that would have been difficult to obtain a few years ago.

In May 1976, 11 companies that were mining or prospecting for uranium in Niger met in Niamey and pledged to put together 15 billion CFA francs out of a total investment then estimated at 25 billion CFA francs. In September 1976, a financing agreement was to be made between the following companies: the National Mining Resource Office (ONAREM), the Air Region Mining Company (SOMAIR), the Akouta Mining Company (COMINAK), the Djado Mining Company, for Niger; the General Nuclear Materials Company (COGEMA), for France; AGIP Nucleare, for Italy; and the Overseas Uranium Resources Development Company (OURD) for Japan.

Five or six other companies interested in Niger's uranium (British Nuclear Fuel, Ltd.) (Great Britain), Conoco (United States), Esso Minerals (United States), the Iranian Atomic Energy Organization (Iran) and the Panocean Oil Company (Canada) did not participate in the signing of the protocol.

The protocol provided for the establishment of a concessionary company for the Tahoua-Arlit road (Concerta), with a capital of 2.2 billion CFA francs, and a financial pledge of 15 billion CFA francs for work expected to last between 4 and 5 years.

Allocation of Work

The call for bids was issued in August 1976 for three phases of work to be completed:

1) Tahoua-Tamaya, a paved road 199 kilometers long (1.3 million cubic meters of earthwork, 390,000 cubic meters of causeway, 1.3 million square meters of surfacing and 170 pipes or channels);

2) Tamaya-Agadez (209 kilometers of paved road) plus the Tiguidit-In-Gall crossover (48-kilometer-long dirt road) and the Agadez road system (5 kilometers of paved roads), or 1.15 million cubic meters of earthwork, 570,000 cubic meters of causeway, 1.35 million square meters of surfacing and 140 pipes or channels; and

3) Agadez-Arlit (243-kilometer-long dirt road), or 1.75 million cubic meters of earthwork, 430,000 cubic meters of causeway and 400 pipes or channels.

Phase 1 was allocated to a consortium made up of the following: Dredging and Public Works (France), a pilot enterprise; the Razel Brothers Enterprise (France); Bilfinger and Gerger Bau (FRG); Satom (France); the National Construction Company of Niger (SNGTN) (Niger). The work planned will total 4,770,400,000 CFA francs.

Phase No 3 from Agadez to Arlit was awarded to the same consortium, but instead of the dirt road initially planned, the 243 kilometers of this section will be paved and will be a two-way road (8.6 meters wide, 8 meters of causeway, 6 meters of surfacing). Cost: 5,931,200,000 CFA francs.

Phase 2 was entrusted to Fougerolle (pilot firm) and Bourdin and Chausse. Cost: 6,218,300,000 CFA francs.

Supervision of the work is in the hands of the Central Study Office for Overseas Equipment (BCEOM) (966.1 million CFA francs).

Work should be completed by 1983-1984. Niger will then have two major roads: one west-east road from Tillabery (or Tera, or Torodi) to N'Guigmi and serving all the major cities in the south, and a south-north road, from Tahoua to Arlit. Domestic communications will therefore be facilitated and the penetration of the desert will constitute an important phase in the fierce struggle that the country has to wage against it.

11,464
CSO: 5100

FRANCE

LAUNCHING OF NUCLEAR ATTACK SUBMARINE DELAYED

Paris AIR & COSMOS in French 2 Jun 79 p 45

[Text] Launching of the French Navy's first nuclear attack submarine, scheduled to take place on 25 May at the Cherbourg Naval Shipyard, has been postponed until a later date. After having to cancel the official ceremonies at the beginning of last week, the port commander's office was also compelled to forgo launching the ship owing to a strike by the personnel in the naval shipyard. The SNA-72, named Provence, is the first of a series of five nuclear attack submarines. It is to undergo official trials in October 1980 with a view to going in commission about a year later. The Provence is a 2,670-ton ship submerged, served by a 66-man crew. It will be armed with 14 wire-guided missiles for attacking ships and, subsequently, with SM-39 antiship missiles with a 50-kilometer range. These SM-39 missiles, manufactured by Aerospatiale, can be fired submerged by the submarine by means of the torpedo tubes.

10,042
CSO: 3100

END