

JPRS-TND-88-019
31 OCTOBER 1988



**FOREIGN
BROADCAST
INFORMATION
SERVICE**

JPRS Report

Nuclear Developments

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

DTIC QUALITY INSPECTED 8

19980529 131

Nuclear Developments

JPRS-TND-88-019

CONTENTS

31 OCTOBER 1988

CHINA

China Achieves Breakthrough in Nuclear Technology [XINHUA]	1
French Nuclear Power Delegation Visits China	1
Meets With Li Peng [XINHUA]	1
Meets With Wang Fang [XINHUA]	2
Reprocessing of Daya Bay Nuclear Waste Undecided [Hong Kong SOUTH CHINA MORNING POST 9 Sep 88]	2

LATIN AMERICA

ARGENTINA

Nuclear Plants Cease Operation for Lack of Funds [Buenos Aires CLARIN 17 Oct 88]	3
CNEA Chairman Comments on Chubut Nuclear Dump [Buenos Aires TELAM 19 Oct 88]	3

NEAR EAST & SOUTH ASIA

INDIA

Radioactive Matter for Pakistan Seized in Gujarat [Calcutta THE TELEGRAPH 27 Aug 88]	4
Minister Affirms Nuclear Plants From USSR Safe [Bombay THE TIMES OF INDIA 1 Sep 88]	4
AEC Chairman Emphasizes Importance of Nuclear Power	4
Speech to Seminar [New Delhi PATRIOT 26 Aug 88]	4
Anxieties Should Be Met [New Delhi PATRIOT 30 Aug 88]	5
Papers Report on Progress of Narora Nuclear Power Plant	5
Fuel Loading Begins [Madras THE HINDU 25 Aug 88]	5
No Foreign Heavy Water [Bombay THE TIMES OF INDIA 25 Aug 88]	6
No Danger to Ganges [Calcutta THE SUNDAY STATESMAN 28 Aug 88]	7
Uranium Reserves Discovered in Meghalaya [Delhi Domestic Service 14 Oct 88]	7
Misgivings Over Radiation From Nuclear Sub Told [Madras THE HINDU 10 Sep 88]	7

WEST EUROPE

BELGIUM

Mol Nuclear Center Director on Research, Waste [Brussels KNACK 24 Aug 88]	10
---	----

FRANCE

Uranium-Enrichment-Services Contract With Japan Renewed [Paris LES ECHOS 28 Sep 88]	13
---	----

IRELAND

UK Nuclear Industry a Danger to Irish Public [Dublin THE SUNDAY PRESS 14 Aug 88]	13
Nuclear Link to UK Threatens Irish Neutrality [Belfast NEWS LETTER 28 Aug 88]	15

TURKEY

15-to-20-Megawatt Nuclear Reactor Planned for Ankara [Ankara ANATOLIA 16 Oct 88]	16
--	----

UNITED KINGDOM

Radioactive Contamination of Irish Sea Protested	16
Revelations From Greenpeace [<i>Belfast NEWS LETTER 10 Aug 88</i>]	16
Waste From UK Reactors [<i>Belfast NEWS LETTER 15 Aug 88</i>]	17

China Achieves Breakthrough in Nuclear Technology

OW1910160088 Beijing XINHUA Domestic Service in Chinese 0903 GMT 19 Oct 88

[Article by reporters Shi Baohua and Chen Jinwu]

[Text] Beijing, 19 Oct (XINHUA)—At the early hour of 0556 on 16 October, heartening tidings come out of the Institute of High Energy Physics of the Chinese Academy of Sciences, located on the western outskirts of Beijing. An electron-positron collider, China's first high-energy accelerator, successfully went into operation in Beijing on its first try.

This is another major breakthrough achieved by China in advanced science and technology, following the successful explosions of atomic and hydrogen bombs and the launching of artificial satellites in space.

The Beijing electron-positron collider, a high-technology project carried out under a policy decision of the party Central Committee and the State Council, consists of four major components: an electronic injector [dian zi zhu ru qi 7193 1311 3137 0354 0892], a storage ring, a detector and data processing center, and a synchrotron radiation laboratory. It is a complex systems engineering project composed of several hundred kinds and over 10,000 parts of highly sophisticated special equipment. Its completion and successful operation have opened up broad prospects for the applied research of particle physics and synchronous radiation, and have added a new chapter to the study of high-energy physics in China.

The construction of the collider, regarded as the largest scientific research engineering project in the history of science and technology in China, was started on 7 October 1984, with Comrade Deng Xiaoping breaking the ground for construction. Over the past 4 years, the leading group on the collider engineering project, which was entrusted by the party Central Committee and the State Council, effectively organized and led nearly 10,000 scientific and technical personnel, workers, cadres, and PLA officers and soldiers of the Institute of High Energy Physics and a dozen central departments and commissions, as well as hundreds of affiliated plants, research institutes, and schools of higher learning, in overcoming mounting difficulties with the arduous spirit of self-reliance and confidence and by absorbing the world's advanced technology, thereby successfully designing, developing, manufacturing, installing, testing, and adjusting the collider with miraculously fast speed, economic investment, and good quality. The completion and successful operation of the collider indicates that China's science and technology and industrial production have reached a level whereby China is capable of independently studying and developing high-technology equipment, and show that China has joined the world's advanced countries in accelerator technology.

This high-technology engineering project has attracted attention from international scientific and technological circles throughout its construction. Hundreds of scientists from the United States, Japan, the Soviet Union, and Western Europe who visited the construction site in Beijing in recent years have expressed their admiration for the project's construction speed, quality, and level, and have offered many useful suggestions. Prof Tsung-dao Lee, who arrived in Beijing yesterday to attend a Sino-U.S. meeting on cooperation in high energy, called the successful operation of the Beijing electron-positron collider a monumental event in international high-energy physics. To complete such a complicated high technology project in merely 4 years is a pace rarely seen in the world. The successful operation of the collider on its first try shows that its equipment, quality of the components, installation, testing, and adjusting have reached the world's top levels.

According to a senior staff member of the Chinese Academy of Sciences, the Beijing electron-positron collider, with its special characteristic in the applied research of particle physics and synchronous radiation, will be built into a national laboratory opened to other units, a base laboratory for joint experiments by various departments and subjects.

At present, experts of the Institute of High Energy Physics are making preparations for continuing the testing and adjusting and physical experiments in order to increase the reliability of various equipment and enable brightness and other targets to meet the designed requirements as quickly as possible through conducting physical experiments.

French Nuclear Power Delegation Visits China

Meets With Li Peng

OW0810002788 Beijing XINHUA in English 1432 GMT 7 Oct 88

[Text] Beijing, 7 Oct (XINHUA)—Premier Li Peng met with Jean Claude Leny, president of Framatome of France, and his party here this afternoon.

Li Peng extended his warm welcome to Leny, who has come here to explore possibilities for further cooperation in nuclear power industry with China's departments concerned.

They also exchanged views on prospects for the development of nuclear power.

Present was Minister of Energy Resources Huang Yicheng.

Meets With Wang Fang

OW1010213788 Beijing XINHUA in English
1315 GMT 10 Oct 88

[Text] Beijing, 10 Oct (XINHUA)—Chinese State Councillor Wang Fang met with a delegation of the French Inter-Ministerial Commission for Nuclear Security headed by its secretary-general Yves Moures here today.

The French visitors, invited by the Chinese Ministry of Public Security, of which Wang Fang is the minister, are here to compare notes with relevant Chinese departments in ensuring nuclear security.

They are scheduled to visit China's nuclear power plants now under construction in Guangdong and Zhejiang Provinces.

Briefing the visitors on China's nuclear security efforts, Wang said China put security and quality above everything else in utilizing nuclear power. He also expressed willingness to strengthen cooperation with France in the field.

Yves Moures said they are ready for cooperation and exchanges with China.

Reprocessing of Daya Bay Nuclear Waste Undecided

51400014 Hong Kong SOUTH CHINA MORNING
POST in English 9 Sep 88 p 2

[Article by Andy Ho]

[Text] The Chinese uranium supplier for the Daya Bay scheme is not obliged to reprocess radioactive waste from the nuclear power station under the present terms of its newly-secured contract.

The Guangdong Nuclear Power Joint Venture Company (GNPJVC), which is responsible for the \$28.8 billion Daya Bay project, yesterday clarified that it had yet to decide how to get rid of nuclear waste from its reactors.

The company said waste disposal was not covered in its contract with the China Nuclear Energy Industry Corporation (CNEIC).

It is a common practice in the United States that spent nuclear fuel is returned to the uranium supplier for reprocessing.

The GNPJVC said it did not rule out concluding a reprocessing contract with the supplier later, adding that there were other options for disposing of radioactive waste.

One option is to bury it in controlled dumping sites in remote areas.

The Sino-Hongkong joint venture company declined to disclose the value of the contract, which was sealed on Wednesday and will last till the year 2015.

The Daya Bay joint venture—formed between the Hongkong Nuclear Investment Company and the Guangdong Nuclear Investment Company—will end 20 years after the station's second generating unit is commissioned.

The unit is expected to come on stream by July 1993.

The Beijing-based CNEIC is now responsible for all low-level enriched uranium for the consumption of the two 900-megawatt reactors at Daya Bay.

The GNPJVC had not called for tenders for the uranium supply contract.

A company spokesman said the Chinese corporation was selected after careful assessment of its capacity and price comparison on an international basis.

The CNEIC is capable of producing both natural and enriched uranium. It has been supplying nuclear fuel to atomic power stations in France, Belgium, Finland and Germany since the early 1980's.

Also tucked under its belt is a uranium supply contract for the Chinese nuclear power station in Qinshan near Shanghai.

The low-level enriched uranium fuel will not be immediately ready for use at Daya Bay.

Instead, it will have to be delivered to France to be processed and fabricated into what is called a rod assembly.

The fuel rod assembly will then be transported to Daya Bay for the initial core, and subsequent first re-load of nuclear fuel for the first reactor unit.

A separate contract was earlier granted to a French nuclear utility, Framatome, for the fabrication of the Chinese low-level enriched uranium fuel for these two loadings.

Similar fabrication contracts will have to be negotiated for the second reactor unit at Daya Bay and further re-loadings of its first unit.

Framatome is also responsible for supplying the two pressurised water reactors for Daya Bay.

/9604

ARGENTINA

Nuclear Plants Cease Operation for Lack of Funds

*PY1910141188 Buenos Aires CLARIN in Spanish
17 Oct 88 p 19*

[Text] The construction of the Atucha II nuclear power plant and the heavy water plant have ceased. Work has also stopped at the RA 3 Ezeiza reactor, which is used to produce medicines. The RA 3 reactor has not operated for over a year for lack of maintenance. The situation has recently been aggravated by a pipeline breakdown in Atucha I, also for lack of maintenance.

The areas of research, development of new products, production of medicines, and radiation have not operated properly either for lack of funds. This situation has forced the government to import the radioactive mud that the RA 3 reactor is not producing.

Authorized sources say that the heavy water plant is 92-percent complete, and only \$50 million more are needed to finish the project. While the amount needed seems very small, the heavy water currently being used by the Embalse power plant is rented from Canada and must be returned at a cost of \$250,000 a ton.

The real cost of not finishing the heavy water plant in time is \$200 million. These losses are in addition to the loss of revenue for as long as the plant is not operational.

The same thing is happening with the Atucha II power plant because the cost of generating energy has jumped to five times the initial estimate. These costs are surprising considering that nuclear power plants are supposed to produce the cheapest energy supply during their estimated 25-to-30-year useful life.

Authorities have also made mistakes in their load distribution policy to the national grid. They have used nuclear power plants, which are designed to operate as base units because they produce energy at a constant rate as peak-hour units. The cost of operation at half capacity is the same as the cost of production at full capacity. This is the main difference with hydroelectric or thermal power plants, which can be made to generate varying amounts of energy.

At present the Atucha and Embalse power plants do not have spare parts for maintenance. The problem jumped to the fore when El Chocon [hydroelectric] energy production dropped, affecting the entire national grid. At the time, Atucha did not have the funds to import the heavy water that spilled. Authorities had to urgently bring heavy water from the FRG by plane because the plant had only 7-days' reserve supply.

It is difficult to evaluate the prospects for nuclear energy production development in the country under these circumstances. There is every indication that the nuclear power development will continue to be bogged down for lack of investments in the sector, something that did not occur until a few years ago.

Walter Dal Maschio, secretary of the Argentine Union of State Suppliers (UAPE), has proposed that the private development of the sector continue until the historic levels of investment have been recovered. For the time being, the nuclear sector continues operating at half capacity.

CNEA Chairman Comments on Chubut Nuclear Dump

*PY1910194588 Buenos Aires TELAM in Spanish
1242 GMT 19 Oct 88*

[Text] Buenos Aires, 19 Oct (TELAM)—CNEA Chairman Emma Perez Ferreira today said a study for the construction of a nuclear dump in Gastre, Chubut Province, is under way. She said the study will be finished during the next presidential term or the following one.

She reasserted that the construction of a nuclear dump is a political decision that must be made by the ruling government. She also said the issue must be discussed by Congress.

Perez Ferreira admitted she is being optimistic when she says the Atucha I nuclear plant will be operating in a few weeks. Originally, technicians had detected a fault in one cooling pump of the reactor. Exploratory equipment, however, detected more significant damage, which requires that several tubes be replaced.

Perez Ferreira also denied rumors that the German team of engineers that arrived last week in Argentina to study damages to the Atucha I plant had not detected any damage.

The CNEA chairman said: "A five-man commission arrived from Germany. Together with CNEA people, they examined the faulty equipment. The members of the commission carried a report to Germany with them, and they are now awaiting further orders from us. She said that if we are unable to resolve the problem, Argentina will request the cooperation of the Germans."

Perez Ferreira, in a statement to Radio Splendid, also said that Argentina is unable to resolve all of the Atucha I problems by itself.

INDIA

Radioactive Matter for Pakistan Seized in Gujarat *51500011 Calcutta THE TELEGRAPH in English* 27 Aug 88 p 4

[Article by Sajeda Momin]

[Text] Ahmedabad, 26 Aug—The Gujarat police seized 2 kg of radioactive material—worth Rs 1 crore in the international market—bound for Pakistan from Petlad district on Tuesday. The consignment was reportedly brought to Gujarat from West Bengal's 24-Parganas district bordering Calcutta.

The police initially assumed that the consignment contained brown sugar. However, preliminary tests showed that the substance was radioactive. The consignment was brought to Ahmedabad in lead-lined steel caskets for testing at the physical research laboratory. Both the laboratories as well as the cancer research hospital confirmed radioactivity.

Three people from the Patel community were arrested in connection with the seizure. The consignment was en route to one of the most infamous smugglers of Kutch—its final destination obviously being across the border.

The director general of police, Mr M.M. Singh, said: "The substance is radioactive, but we are not sure what nomenclature to give it nor its degree of radioactivity." He said the consignment was being sent to the Bhabha Atomic Research Centre in Bombay for further analysis after which more details would be known.

Kutch district is known for its arms and drugs smuggling rings. The annual haul of Rs 2 crores-3 crores of arms and drugs is believed to be only the tip of the iceberg.

/12232

Minister Affirms Nuclear Plants From USSR Safe

51500014 Bombay THE TIMES OF INDIA in English
1 Sep 88 p 7

[Text] New Delhi, 31 Aug (UNI)—The two nuclear power plants India is negotiating with the Soviet Union are among the safest type of such plants operational anywhere in the world, the minister of state for science and technology, Mr K.R. Narayanan, informed the Lok Sabha today.

Replying to a supplementary by Mr Vakkom Purushothaman (Cong), the minister said these two plants were different from the Chernobyl type.

He clarified that the member's reference to the PRAVDA article by a Soviet academician enlisting the design hazards of the Soviet nuclear power plant related to the Chernobyl type and had nothing to do with the type India was intending to purchase.

He said the location of the plants would be decided on the recommendations of the site selection committee.

He said some Soviet credit package would come along with the two Russian plants. The question of the Soviet Union taking back the entire spent fuel was also under discussion, he added.

The minister assured Mr C.P.N. Singh (Cong) that the induction of the plants would not in any way affect India's indigenous nuclear electricity generation plan targets.

/12232

AEC Chairman Emphasizes Importance of Nuclear Power

Speech to Seminar

51500012 New Delhi PATRIOT in English
26 Aug 88 p 5

[Text] Lucknow, 27 Aug (PTI)—Nuclear power assumes importance for India mainly because there is not other source of power at the moment that holds so much promise in terms of unending supply of electricity in a clear and efficient manner.

Stating this while delivering the keynote address at a seminar on "atom for peace and prosperity" here today, chairman of the Atomic Energy Commission Dr M.R. Srinivasan said solar energy and its derivatives like wind and the ocean waves were in a highly diffused form and could only be used in a localised manner to buttress other sources of energy.

The magnitude of the problem involved in converting solar energy into a viable source of electricity was illustrated by the fact that a 1000 mw capacity solar plant would require about 10 sq kms of land surface on the basis of available technology, he said.

"As regards coal, which is a major source of electricity in India, it is known that a 2000 mw coal-fired plant consumes more than 25,000 tonnes of coal and 200,000 tonnes of air per day if operated round the clock, besides emitting about 45,000 tonnes of carbon dioxide.

Dr Srinivasan said the Indian atomic energy programme was launched with the realisation that available conventional sources of energy in the country—thermal and hydel—were not adequate to meet the planned developmental programmes.

The Tarapur atomic power station, commissioned in 1969 had contributed about 15 percent of the installed capacity in Maharashtra at that time. "Even now it is supplying the cheapest non-hydel power in the country.

"With the commissioning of the Madras atomic power station in 1983, India attained self-reliance in the design, construction and operation of nuclear power reactors and all associated facilities.

"The confidence generated by these activities have led to the programme of attaining an installed capacity of 10,000 mw of nuclear power by the year 2000 AD," he said.

Dr Srinivasan said electricity was vital to increase the momentum of our agricultural production to feed the growing population which could very well overtake that of China in a few decades.

Agriculture accounted for nearly 25 percent of electricity consumption in India. Besides, the impact of a rapid increase in population with inadequate access to electricity or fossil fuels had already been severe on our forests and ecological wealth.

"The fact that wood is the primary source of energy for domestic cooking of a vast section of our people has been the root cause of our dwindling forests. It will be naive on our part to tackle deforestation without addressing ourselves to the fundamental economic problems that lie underneath such destructive tendencies," he added.

Anxieties Should Be Met

51500012 *New Delhi PATRIOT in English*
30 Aug 88 p 4

[Editorial: "Srinivasan on N-Power"]

[Text] Nuclear power plants have lately come under increasing attacks from the environmentalists. In countries like India, the nuclear power assumes importance mainly because there is no other source of energy at the moment that holds so much promise in terms of supply of electricity in an assured and efficient manner. The importance of nuclear plants in countries like India, lies in the fact that at a stage of computation of economic and social costs it offers the cheapest and, perhaps, most assured, source of energy, despite heavy initial investments and longer gestation periods than hydel or thermal stations. For India, rich in thorium and uranium deposits and with adequate scientific talent and technical manpower, the merits of nuclear energy are undeniable. Nuclear energy has inevitably become the lynchpin of the country's long-term plans for meeting the growing demands for energy.

The efforts to generate nuclear power in the country, however, have moved tardily over the years since the first nuclear plant project at Tarapore in 1969. Against a target of 10,000 MW of nuclear power by the turn of the century set by the Nuclear Power Corporation, the cumulative

capacity of all nuclear plants in the country stands at a bare 1230 MW. With the commissioning of Kakrapar in Gujarat in 1991, it is expected to go up to 2170 MW, and to 3110 MW in 1195 when the Kaiga and Rana Pratap Sagar units go into operation. Yet the country, it seems, would have a shortfall of 6890 MW of nuclear power by 2000 AD. At the current pace of nuclear power programme, and in the face of raging controversies about locations of some nuclear plants, suspicions about the quality of civil engineering works and existing safeguards, shortages of heavy water and investible funds, it does seem difficult for the country to achieve the target of 10,000 MW in 12 years. Even if the target is achieved, nuclear power will be only 10 percent of the power production capacity in the country. Yet, even if the target is not met by 2000 AD, the plan has to be pursued in view of the rapid expansion of the demand for power, particularly, from agricultural and industrial sectors, and equally rapid depletion of exhaustible sources of energy like coal and oil. The environmentalists and anti-nuclear lobbyists, echoing criticism in Europe, apparently have not taken into account the depredations of the forests and ecological wealth caused by sole dependence on fossil fuels and neglect to develop renewable energy sources.

Atomic Energy Commission Chairman M.R. Srinivasan has done well to put in perspective the complex socio-economic challenges and the compulsions of the choices before the country. However, criticism of specific projects needs to be answered and genuine problems created by siting and operations of plants sorted out. But, as he pointed out it would be naive to try to tackle the acute problem of deforestation and the resultant ecological imbalance without giving the vast numbers of the poor, who must burn wood to cook food, access to cheap electricity, which nuclear plants can provide. Dr Srinivasan's predecessor, Mr Raja Ramanna, a few days earlier, very pertinently made the point that any neglect of nuclear power could only be at the expense of the country's progress. India, which continues to suffer because it missed out on the industrial revolution during the colonial era, cannot afford to put in jeopardy her future by neglecting new sources of power generation. But it is for scientists and engineers to make this choice safe. Anxieties about the safety of reactors have to be convincingly met and safety made more stringent in the light of recent international experiences.

/12232

Papers Report on Progress of Narora Nuclear Power Plant

Fuel Loading Begins

51500010 *Madras THE HINDU in English*
25 Aug 88 p 7

[Text] Narora (U.P.), 24 Aug—Having obtained the final clearance from the Atomic Energy Regulatory Board (AERB) on 20 August, the fuel loading operation in the

reactor vessel, or calandria, as it is known, of Unit-1 of the Narora Atomic Power Project (NAPP-1) U.P., commenced on Sunday and the Unit is expected to go critical in November 1988.

The NAPP consists of two units of pressurised heavy water reactor (PHWRs) of 235 MWe gross each using natural uranium as fuel Unit-2 is targeted for October 1989.

The NAPP, located at Narora in Bulandshahr district of U.P. right on the bank of the Ganga, will be the fourth nuclear power station in the country. The other three are at Tarapur (near Bombay), Rawat Bhata (near Kota) and Kalpakkam (near Madras). The power from Narora will be fed to the Northern Grid at 220 KV through five lines, two to Khurja, one to Simboli, one to Hardwarganj and one to Moradabad. The cost per unit when the Unit goes commercial is expected to be around 65-70p.

Location in seismic zone: The project report, prepared in 1972, was sanctioned in 1974. Land acquisition and ground breaking took place in 1976. Originally, scheduled to go on stream in 1981-82, the NAPP has been subject to delays since the project proposal went on the drawing board. The original design has undergone a large number of changes compared to the predecessor stations the prime reason for which being the location of the site of the nuclear reactors on a seismically active zone. This has necessitated not only changes in the basic reactor system, but also incorporation of 100 percent double containment to minimise radioactive leakage if an accident occurs.

The project, originally estimated to cost Rs 209.89 crores is now estimated to cost Rs 532.84 crores. The main reason for the upward revision, according to Mr S.L. Kati, managing director of the National Power Corporation (NPC), who took the journalists party on a preview tour of the reactor unit, are essentially due to escalation in prices, design changes necessitated by seismic considerations, changes in the emergency core cooling system, scaling up the size of certain equipment in the interest of easy adaptability for future 500 MWe stations and safety in depth criteria adopted. In fact, two additional safety systems came after the project report, Mr Kati said. The NAPP designs will be used as standards for the future PHWRs in India, Mr Kati said.

Major change in design: One of the major changes from the original design—in fact, not related to any safety aspect—is the installation of cooling towers which became necessary after the UP Government expressed its inability to provide sufficient cooling water throughout the year. Now a recirculating type of cooling system has been adopted. The plant head load is rejected to the atmosphere by means of 128m high cooling towers, having a flow rate of 43600 cub m/hr. The evaporation losses are drawn from the raw water pump house.

In the grading of seismic zones from one to five—seismicity increasing with the number—Narora is termed as zone-3 that is, the site is in an area of moderate intensity seismicity. Design of structures for a seismic area is a new subject and this is especially so for a nuclear structure where safety must not be compromised even under the worst earthquake that a site may experience, Mr Kati said.

Safeguard against seismic activity: Extensive analytical work had to be done to evolve the appropriate design for the various structures, he added. Changes have been made even within the core of the reactor resulting in “integral end-shield calandria assembly so that under any seismic activity, various parts of the reactor core vibrate as one whole system and there are no differential or out-of-phase motions of the core’s subsystems.”

Explaining the criteria adopted for safety design of the reactor system against seismic activity Mr Kati said that they conform to the guidelines laid down by the IAEA. Given a site its seismic evaluation is based on regional geology and geophysical investigations that are carried out to establish the local characteristics of the strata. On this is superimposed the historical earthquake data to construct the seismotectonic map of the region, which is an area of 300 km radius from the site. For design purposes the highest intensity of earthquake experienced on the nearest fault is taken which for Narora is the quake at the Moradabad fault of magnitude 6-7 on the modified Richter scale.

Shutdown systems: The reactor design incorporates two independent shutdown systems. The Primary Shutdown is a mechanical process which drops down cadmium rods whenever a trip occurs to absorb the neutrons in the core and slow down the fission process. The other, claimed to be equally fast by Mr Kati, is the introduction of liquid poison tube into the core which contains borated heavy water and brings down the neutron energy to far below fissions sustainable levels.

No Foreign Heavy Water

51500010 Bombay *THE TIMES OF INDIA* in English
25 Aug 88 p 15

[Text] Narora, 24 Aug (PTI)—No foreign heavy water is being used in the reactors of the Narora atomic power station (NAPS), the first unit of which is getting ready for commissioning in October, Mr S.L. Katti, managing director of the Nuclear Power Corporation (NPC), has said.

The reactor will require 240 tonnes of heavy water and “all of it is indigenously produced,” he told a party of visiting journalists.

Mr Katti laid to rest speculations about the source of such a large quantity of heavy water that arose in the wake of the auditor general’s report that all heavy water

plants in the country had been working at less than 20 percent their capacity. The total capacity of heavy water plants was about 300 tonnes.

Mr Katti who declined to elaborate, said that unit-2 of NAPS, expected to become critical in May 1990, would also use indigenous heavy water.

The 235-MW unit-1 of NAPS would go critical on 31 October and about a month later would feed power to the northern grid, Mr Katti said.

NAPS technicians on Monday started loading natural uranium oxide fuel into the core of Unit-1. The full loading of the 56 tonnes of fuel into the 306 channels of the reactor vessel will take about a month. Filling of heavy water would commence after clearance from the atomic energy regulatory board, the NAPS station director, Mr K.S. Chopra, said.

NAPS is India's fourth atomic power station, the others being at Tarapur, Kalpakkam and Kota in Rajasthan.

Located on the banks of the Ganges about 140 km from Delhi, NAPS was delayed by 8 years and its cost doubled to Rs 5,320 million. Mr Katti said that the delay was due to a late change in design to make the reactors quake-proof.

Mr Katti said that the design of NAPS, which had several new safety features, would be adopted for all future atomic stations beginning with Kakrapar in Gujarat.

No report on environmental impact was made in the case of NAPS, but Mr Katti said that henceforth such reports would be prepared before construction began.

On the prospects of building a 10,000 MW nuclear power capacity by the year 2000, he said that work had already begun on new reactors with a total capacity of 7,000 MW. Clearance for the remaining 3,000 MW was awaited.

"Once we find new sources of uranium we can go even beyond the 10,000 MW target," Mr Katti said.

He said the 2,000 MW capacity to be created with two Soviet reactors was outside the NPC's programme. India was trying to have these power plants built on a turn-key contract by the Russians, he said.

No Danger to Ganges

51500010 Calcutta *THE SUNDAY STATESMAN*
in English 28 Aug 88 p 9

[Text] Lucknow, 27 Aug—Mr M.R. Srinivasan, chairman of the Atomic Energy Commission, today reassured the country that India's nuclear power plants were safe and fears over the possible contamination of the Ganga by radioactivity from the Narora power station were baseless.

"I would like to assure the people that such contamination is not possible and there is no need for such a fear," he said, delivering the keynote address at a seminar on "Atoms for Peace, Power and Prosperity."

Explaining the details of the safety measures at the power plant, Mr Srinivasan said: "The coolant water which removes heat from the nuclear fuel in the reactor is in a closed loop. Further, it is continuously cleaned. Any water stream which will reach the Ganga will be of drinking water quality. In the unlikely event of an accident, any radioactivity released from the reactor core will be continued in the moderator and coolant water and in the double containment of the reactor building.

He said that there should be a dispassionate and pragmatic, assessment of the safety and environmental aspects of nuclear power in India. "There are more than 400 nuclear power reactors operating in 26 countries and in India, we have had a creditable record of operating this complex technology in a safe manner for nearly 20 years. We have adequate uranium and thorium reserves which can be exploited to provide energy for generations to come.

/12232

Uranium Reserves Discovered in Meghalaya

BK1410034488 Delhi *Domestic Service in English*
0240 GMT 14 Oct 88

[Text] Uranium reserves have been located in Meghalaya. The chairman of the Atomic Energy Commission, Dr Srinivasan, said in Hyderabad yesterday that there are indications that the new find might be a major and an important one.

He said reserves are also likely to be found in Cuddapah District of Andhra Pradesh. Dr Srinivasan said the uranium reserves so far identified in the country are adequate for achieving 10,000 mw of nuclear power capacity by 2000 AD and sustaining it for about 30 years.

Misgivings Over Radiation From Nuclear Sub Told

51500013 Madras *THE HINDU* in English
10 Sep 88 p 4

[Text] Visakhapatnam, 9 Sep—The presence of India's only nuclear power propelled submarine, INS Chakra, off Visakhapatnam coast has become a bone of contention with environmentalists.

They fear that radiation effects of the small reactor aboard the sub will contaminate the sea water beaches and air, posing a health hazard to the citizens of Visakhapatnam, particularly to over 8,000 civilian and military personnel of the naval base of the Eastern Naval Command and the Naval Dockyard where the sub is berthed now and then for refuelling and change of sailors.

Prof T. Sivaji Rao of the Andhra University, a crusader for clean environment, has repeatedly expressed his anxiety over the possible increase in the radiological levels in and around the city and has suggested that the Nuclear Physics Department of the university make it a point to measure the same regularly.

The civilian employees of the Naval dockyard are also agitated ever since the death in June last of a 34-year old scientist, A.V. Suryanarayana, who was working in the Radiochemical Laboratory (RCL) attached to the Naval dockyard.

In the pink of health: Suryanarayana, according to his father, was stated to be in the pink of health when he joined the Navy in 1983 and until July 1987 when he was shifted to the RCL. After he started working in the RCL, his health deteriorated with recurring fever and appearance of black spots on his legs.

A private doctor advised him to undergo tests for possible leukaemia symptoms. Suryanarayana was tested in INS Kalyani. The tests took place on 14 June. On 18 June, he suddenly collapsed and was taken to the private doctor who advised that Suryanarayana be taken to the CMC hospital in Vellore for bone marrow test and further treatment. But Suryanarayana was declared dead on 20 June even before he could undergo the test in the Vellore hospital.

The exact cause of Suryanarayana's death will never be known as no post mortem was done as the father was stated to be unwilling.

Vital questions: Some of the vital questions are how and when Suryanarayana contracted leukaemia; will it be possible for a person to develop leukaemia from occasional radiation effects in a short span of less than 1 year of such an exposure. The expert opinion is divided on these issues.

But the hush-hush manner in which the whole episode was treated by the naval authorities has naturally raised suspicions among the public. "There is nothing hanky-panky in the death," asserted Vice-Admiral S.C. Chopra, Flag Officer Commanding-in-Chief of the Eastern Naval Command at a press conference in the Naval dockyard.

Suryanarayana's radiation levels had been regularly measured with the help of a dosimeter as per the practice in the RCL. Never did he have more than 0.001 REMS during his tenure in the RCL. The permissible radiation level of over and above the natural background radiation is five REMS. So, his death could not be traced to his low level radiation. Possibly, the suspected Leukaemia must have surfaced suddenly as it happens also in cases of people who never get exposed to radiation," Vice Admiral Chopra explained.

"We have the medical report on Suryanarayana's case which clearly states that his death had nothing to do with

the area of his work and certainly not related to radiation." However, he said the report could not be released for publication.

Highest safety standards: He emphasised that INS Chakra's reactor "has all the highest safety standards recommended by the International Atomic Energy Commission. The environment safety committee of the Bhabha Atomic Research Centre including two health experts, Dr Nagaratnam and Dr Subbaratnam, thoroughly examined the anti-radiation facilities available both in INS Chakra and the RCL complex and had certified that the two had been "over designed safetywise." The committee makes periodic visits to the safety facility complex for inspection and the latest certificate of safety was given on 23 May.

Vice Admiral Chopra attributed the fear of health hazards to the popular misconception that INS Chakra might be having some radioactive missiles. "INS Chakra is only a nuclear power propelled submarine and barring this it is as good as any other sub propelled by diesel or battery power. The purpose of having nuclear power propulsion is to facilitate the sub to remain under water for a very long time as the system is air independent unlike in conventional subs. Nuclear power propulsion is cheaper than diesel and also cleaner because the wastage is limited."

If there were risks to human safety would world navies go in for such subs, he asked. "The Soviet Union has 190 nuclear power propelled subs—the United States 134, the United Kingdom 19, France 10, China 8 and India only 1. Indian Navy has risen in stature after the acquisition of INS Chakra which created a flutter in the world and Pakistan is clamouring for such a sub. The submarine is essential for peace time purpose of a blue water navy to protect the country's international trade from being interfered by enemy agents.

At the special safety service facility complex where a party of newsmen were taken round by Vice Admiral Chopra, strict standards are maintained to protect the personnel involved in the activities of INS Chakra. It is a very high security zone where even many naval personnel are forbidden entry.

Testing of samples: The RCL tests samples suspected of radioactivity from the sub to certify the health of the power plant. The radiobiological lab (RBL) undertakes testing on the samples of air, sea water, marine growth, soil, etc., at specified intervals to detect radioactivity within both the inner circle of 200 metres rcle of 200 metres radius where INS Chakra is berthed while ashore and the outer circle of 800 metres radius covering a vast perimeter of the Naval Dockyard and the nearby Vizag Port.

Said one of the scientists working in the complex, "we neutralise the reactor wastes before disposal and decontaminate all samples with radioactivity symptoms. In all

the testing done by us since the inception of this complex we have not found any change in the radiological levels so far in the environment."

According to Vice Admiral Chopra all scientific personnel of the RCL and the RBL [are] monitored once a month for any signs of inhalation or ingestion of radioactive material. This is done using a meter which measures the activity in the thyroid gland which has a strong affinity for radioactive iodine.

Reiterating that Suryanarayana's death "is an act of God" Vice Admiral Chopra declared "we are not here to sacrifice the lives of the 50 sailors aboard the sub and tens of scientific personnel in the RCL and the RBL and endanger thousands in the Naval Dockyard." He appealed to the people to understand the secret nature of the submarine project and appreciate its safety measures.

/12232

BELGIUM

Mol Nuclear Center Director on Research, Waste

51002403 Brussels KNACK in Dutch

24 Aug 88 pp 12-14

[Interview with Carl Malbrain, director general of the Mol Nuclear Energy Research Center, by Peter Renard: "The Mol Account"; date and place of interview not given]

[Text] The Nuclear Energy Research Center [SCK] in Mol did not hire a Jean Gandois or a Thyl Gheyselinx, even though there was/is enough work for a crisis manager. Even without the Transnuklear affair, the SCK was in trouble. The reasons: acute lack of money, obsolete infrastructure, aging personnel, nonexistent or failing management, a fossilized and rust encrusted entity. Add to this the community tug-of-war surrounding this national institution which will be partly regionalized.

The parliamentary committee which dealt with the Transnuklear scandal had a shattering opinion of the previous administration. A new team is making a new start now. This team includes two noteworthy outsiders: Gilbert Eggermont, a former academic and the ABVV [Belgian General Federation of Labor] expert on nuclear energy, and of course the successor of Severin Amelinckx, Carl Malbrain. Together with the chairman of the Board of Directors, they will have to jack up the image of the SCK. They will also have to implement the new budget cut policy. Five years from now, only 850 of the 1200 employees will remain. However, an additional 100 young scientists will be hired. After the precarious situation Honore Paelinck found himself in with the railroads, the young academic knows what he is up against.

Malbrain is 30 years old. He studied at the Catholic high school of the Holy Virgin in his native town of Dendermonde. At the University of Louvain he majored in civil engineering as well as in mathematics and physics. By the end of 1979 he crossed the ocean. At the Massachusetts Institute of Technology he obtained an MA in Nuclear Engineering. He earned a PhD with a dissertation on "Energy Technology and Policy."

His main specialization is nuclear waste processing. This was useful in his work at Wastechem, a company which experienced explosive growth, where he was employed until now. Ironically, Wastechem was established by two West German companies, one of which is Nukem. Nukem hit the news more than it would have liked because of one of its subsidiaries, Transnuklear!

In the United States, Malbrain concerned himself, among other things, with putting technology developed in Western Europe, and primarily in the FRG, on the market. Another coincidence: one of the most successful operations involved the licensing for America of the

German DKW's Pamela process. That vitrification plant for highly radioactive waste is located in... Mol, on the land of the former Eurochemic.

Malbrain is exploring the terrain in Mol. He is someone from here who also has the advantage of being an outsider. He is not connected with the multi branched nuclear lobby, and is still surprised about the way things are being done in this country. His experience in the United States has left its mark. He is a fervent proponent of a better separation of responsibilities in the nuclear world, a separation between the regulatory, the operational, and the supervisory bodies. In this sense, he feels that the parliamentary committee's recommendations did not go far enough.

Malbrain feels that work at the SCK must be more efficient, with proportionately more scientists who would be paid what they deserve. He definitely wants to get rid of the famous waste department by 1989. The National Institute for Radioactive Waste and Fission Materials will take over that task. As for the gang still at the SCK, the polluters will have to pay for that.

The SCK did not spare any effort to bring Malbrain to Mol. Three headhunter agencies were on his trail. At the time, they did not know that this was a wasted effort, because Malbrain would apply of his own accord. For himself, it is nice to know what other people think of him.

Financial Headache

[Carl Malbrain] The main problem for the headhunters was my age. And there was the additional fear that, faced with the complexity and rigidity of the situation, I would pack my bags and leave, bound for America.

[Question] That danger does not exist?

[Malbrain] I don't think so. This is a challenge that I am trying to meet. My management experience is too limited for me to be a crisis manager. Hence, I believe that the choice fell on me because of my technical knowledge, especially in the area of waste processing. My industrial experience, which I got in America, also scored in my favor. The SCK's know-how must be capitalized on.

[Question] Is that what the president of the Board of Directors of the SCK, Ivo Van Vaerenbergh, means when he says that the task of the SCK is more of a commercial one?

[Malbrain] Yes, but the SCK should not develop commercial activities itself. There are other ways to convert knowledge into cash: with licences and royalties. Here we have to work on prototypes, on pilot installations, through which we have an impact on the needs of the government and industry.

[Question] You are coming from American industry into a semipublic research center. What are your first impressions?

[Malbrain] In the United States I had become used to the hire and fire principle. Both in the private sector and in government programs, the rules for hiring people are less rigid, but employees are also more easily dismissed. The labor market is much more flexible than here, and engineers especially can quickly find another job. In the SCK, the permanence of a job has a great influence. It is much more difficult to continue to motivate people. That is what has struck me most.

Another problem is the obsolescence of the infrastructure and the aging personnel. During its first years, the SCK experienced rapid growth, but then it stagnated.

[Question] The permanence of jobs and the obsolescence are factors which you need to take into account, which you cannot change.

[Malbrain] In this respect, I would refer you to the action plan of the Board of Directors. New investments must be made, the personnel must be rejuvenated—among other things, through the hiring of 100 young university graduates over the next 5 years—the operation must be made more efficient, and we must limit the number of research areas. At the present time, our research is spread too thin over too many areas.

[Question] Do you think that you have enough baggage at your disposal to lead the SCK management along the right paths? It was especially there that the shoe pinched.

[Malbrain] I obviously have experience with the companies we have worked with. Nukem, Westinghouse, Fluor Engineering: all of them have gone through a reorganization. In that sense I have built up a certain amount of passive knowledge. On the other hand, I am also knowledgeable about the growth problems of a small company. Over a period of 5 years, Wastechem expanded from 7 to 350 employees.

The main problem of the SCK is financial. We are saddled with a heavy inheritance from the past. No matter what happens, the SCK will experience a financial hangover from the Transnuklear scandal. The processing of all nonprocessed waste in the Waste Department and the dismantling of some installations may cost as much as 1.5 billion Belgian francs. This is only a first rough estimate, and I suspect that it is an underestimate. A definite estimate is expected by the end of the year.

Other liabilities from the past are SCK nuclear installations which are no longer used. First estimate: 2.5 billion Belgian francs for the safety and final dismantling of the idle BR3 reactor.

According to the plan, the BR2 materials test reactor can remain in operation until 1992. Its dismantling will probably cost about 2 billion Belgian francs. This does not include the cost of processing the fuel rods. In addition, provisions must be made for their geological storage, and based on the current NIRAS rates, this will cost 500,000 Belgian francs per cubic meter.

Hence, the total cost for this operation will be 6 to 10 billion Belgian francs. These are enormous costs which the SCK cannot possibly handle within the framework of a normal budget. Not even if they are spread over a period of 20 years or if we reject all partnerships with such companies as Belgonucleaire, Indaver, and others. That would produce at the most a couple hundred million Belgian francs.

There is only one good solution. After making an inventory of all the waste products, we will divide the cost among those who have produced the waste and among those who have profited from our programs.

We will have costs of 1.5 billion Belgian francs in the Waste Department. This involves waste products from Metallurgie Hoboken, from Union Miniere, from Belgonucleaire, from irradiation programs carried out in a European context, from the producers of the fuel rods. The SCK will have to take the initiative itself to knock at the door of these polluters for reimbursement. If that does not work, then the SCK will ask the government to take the responsibility.

[Question] You did not mention the electrical utility companies.

[Malbrain] They also profited from a number of programs, and especially from the operation of the BR3, where their personnel were trained, and from the irradiation programs in the BR2. For now, the waste removal costs for these two have been estimated at 4.5 billion Belgian francs. We will point out their responsibility to the electrical companies. If the government expects the SCK to absorb all the liabilities, then there is only one possibility: to liquidate the SCK. This would not solve the problem, because the liabilities will remain, with or without the SCK.

Not in My Backyard

[Question] How do you yourself look at nuclear waste?

[Malbrain] It is a problem of time perspectives. Nuclear waste represents a problem for society for tens of thousands, if not hundreds of thousands of years. Furthermore, the problem stretches beyond the country's borders. If here in Mol we were to think in terms of the geological storage of radioactive waste, then we need to make sure that it will not poison drinking water in the Netherlands 10,000 years from now, for example.

The question is whether a national or regional government with its short time perspective, in the worst scenario until the next elections, could make decisions with such consequences in time and space. I am convinced that we must search for more global solutions. They are working on that in the United States. But there they are faced with the "not in my backyard" philosophy: nobody wants anybody else's waste. That is a hypocritical situation, which also exists here. Nobody wants low radioactive waste in their municipality, especially not before the municipal elections. The people must be given objective information about it.

I also have questions about the way decisions are made here, especially in terms of energy and the consequences of new technology on society. They often call on ad hoc committees, which are under a strict time pressure. I am pleading for an independent organization, which would study the technical, economic, social, philosophical, and also the moral aspects of such problems as phosphate pollution, acid rain, impairment of the ozone layer, and nuclear waste. This organization would then have to present its advice to parliament.

[Question] Is it the governments which are thinking in periods of time that are too short? Or is there something fundamentally wrong with nuclear energy which will burden society for thousands of years?

[Malbrain] The chemical industry, whose waste products do not have a half-life, represents a much greater problem. Dioxins, PCB's and the like are produced in amounts thousands of times greater than the nuclear waste. The nuclear waste is only the tip of the iceberg. But there are no standards for the chemical industry either. All of this goes well beyond a company or even a state. I expect a great deal from the awakening of public opinion and from an international approach. But we are only in the initial phase.

[Question] Do you still feel the consequences of the Transnuklear scandal today?

[Malbrain] What you feel is the lack of motivation. The SCK as a whole has been blackened by the press, even though only a few people were involved. What is more important is the changed attitude of the government. Originally, the SCK was able to receive a great deal of money. But for a while now, endowments have been limited. A first budget cut program has been in existence since 1982. At that time, the SCK implemented significant savings, reduced the number of employees.

But the government did not meet its obligations. The endowments were not indexed and the extraordinary endowments for investments were limited to two-thirds. Compulsory retirement at the age of 57 is very hard on many workers. And there is the management vacuum which existed for the last 9 months. People did not know

what would happen to the SCK. There was a total lack of management. The only still remaining uncertainty is how to finance the liabilities, and I want clarification about that for 1989.

[Question] There is also the community aspect.

[Malbrain] Most of the nonnuclear programs are already under the jurisdiction of the regional authorities. But their financing is not clear. It is possible that the Flemish administration will step away from endowments and finance project by project. I am even afraid about the division of the SCK into a nuclear and a nonnuclear institution. I regret that, because I feel that there is a great deal of synergy between the nonnuclear and the nuclear activities. As a matter of fact, the nonnuclear activities of the SCK grew out of its nuclear knowledge.

For the Future

[Question] What direction do you want to go with the SCK?

[Malbrain] There is an enormous need in the nuclear area for government support. The main deficiency is the complete lack of standards for nuclear waste, for temporary storage, for land storage, and for geological storage. I hope that after the Transnuklear scandal, the government will take initiatives to make the transportation, processing, and conditioning of radioactive materials dependent on complete knowledge of their composition. The SCK is in a very good position to implement this.

Moreover, the main challenge lies in the area of processing toxic waste. There is no solution for this, and there are no standards for this in Belgium either.

Another challenge lies in the search for new ceramic materials for high temperature applications in industry, and in the semi and superconductors.

In the area of environment and energy, we will have to search for a more efficient use of scarce energy sources.

[Question] Should the SCK also concern itself with sources of energy other than nuclear?

[Malbrain] Yes, I think that is very important. We could perhaps change the name of the SCK to Research Center for Energy and Environment. There is no energy without waste and that flow of waste must be controlled.

[Question] Will you be able to surround yourself with the people you want?
y limited. As a public utility institution, dependent on endowments, the SCK experiences a great deal of political interference in terms of appointments. As a matter of fact, the agreement of both supervisory ministers is required. I think that a different personnel policy should be possible. For me, quality is the first standard, not the language or the political persuasion. I want to attract

young, dynamic university graduates to the SCK. Not to keep them here for the rest of their lives, but to give them the opportunity after a few years to take the step into industry. I see the SCK as an intermediate phase between university and industry, as a turntable. Basic university research can be tested for industrial feasibility at the SCK.

[Question] How will you try to make your mark at the SCK?

[Malbrain] In the first place, I want to adopt a wait-and-see attitude. I want to get to know the unions. A change in mentality must in any case be implemented at the SCK. In a first phase, we must conduct efficient program management. In a second phase, the system of paying what people deserve will be necessary in order to motivate people.

[Question] Do you want to limit the role of the political world and of the unions?

[Malbrain] The role of the political world, definitely. I want to keep the politicians out of the daily management of the SCK. From the unions we can learn a great deal. One of the reproaches addressed to the former management was precisely that they did not listen when the unions pointed out the problems which led to the waste scandal. I do not believe that a confrontation with the unions would produce results. We must work together.

8463

FRANCE

Uranium-Enrichment-Services Contract With Japan Renewed

51002405 Paris *LES ECHOS* in French 28 Sep 88 p 12

[Article by special correspondent Marguerite Laforce: "Cogema Renews Several Contracts With Japan"]

[Text] Cogema (General Fissionable Materials Company) has confirmed its penetration of the Japanese market by renewing for 10 years contracts signed in 1974 to supply uranium enrichment services. In so doing, this 100-percent CEA- (Atomic Energy Commission) owned subsidiary has cinched sales of 600 to 700 million francs a year in Japan for the 1990-2000 decade.

Today, Cogema's place in one of the rare countries, besides Korea, that still has a sizeable nuclear program is becoming stronger. Not only will the company continue to supply the enriched uranium necessary to fuel 15 of the 35 reactors operating in the archipelago, it is participating, through its engineering subsidiary SGN, in the construction of the uranium-retreatment plant the Japanese have decided to install in the north of the country at Rokkasho-Mura.

The installation, which has a capacity of 800 metric tons/year and is modeled on the second phase (UP 3) of the La Hague factory, should be operational by the end of the nineties. In the meantime, the electrical companies and Japanese industrialists (Mitsui, Toshiba, Mitsubishi, Hitachi, etc.) that initiated the project will pay around 2 billion francs to the SGN in exchange for technology transfer and engineering services. This is a stunning victory last year for the French nuclear industry, one which justifies the creation of the SGN-Japan subsidiary in March of 1988 and the inauguration of its new offices this week.

Participation in the construction of Rokkasho-Mura thus completes French exports of retreatment services to Japan, since one-third of the 800 tons/year productive capacity of the UP 3 in France between 1989 and 1999 is slated for Japanese electrical companies.

The Cogema group is still involved in other aspects of the Japanese nuclear market. In particular, it has been selling natural uranium since 1969, a period when France captured approximately 7 percent of the market, or 12,000 metric tons of uranium concentrate. But its contracts are expiring one after the other.

Cogema is therefore currently negotiating for continuation of services—even their extension beyond 1990. In this vein, a contract for some 200 million dollars covering the 1988-2000 period was signed last December with the electrical company Kansai Epco, in the face of very stiff American and Canadian competition.

Tokyo, Primary Competitor

Cogema has also done business in Japan in other sections of the nuclear fuel cycle (fabrication of uranium hexafluoride, sale of anti-corrosive lithium 7 for plants, recycling of retreated uranium and of plutonium . . .). But all the confidence apparently bestowed on it by Japanese electrical companies may not be enough to allow the company to maintain its ranking as the number-one French exporter to the archipelago, with 20 percent of the French sales to Japan. Little by little, Tokyo is equipping itself with the installations it lacked, becoming Cogema's primary competitor. What is true for retreatment is less true for enrichment, management of nuclear wastes, and the supplying of natural uranium.

09825

IRELAND

UK Nuclear Industry a Danger to Irish Public

51500009 Dublin *THE SUNDAY PRESS* in English
14 Aug 88 p 9

[Text] The latest shock revelations from the British nuclear industry that its own inspectors are extremely worried about existing measures for monitoring and controlling emergencies, can give little reassurance to the Irish public. Colman Cassidy reports...

Senior sources from within the Nuclear Installations Inspectorate (the British Government's "independent" monitoring agency) say that emergency plans to protect the public in the event of a nuclear accident are "grossly inadequate". And that's the British public! It begs the question: What should our own Minister for Energy be doing to protect us from the peccadillos of our nuclear neighbors?

The infamous Sellafield reprocessing plant just across the water, the damaged reactor at Trawsfynydd in north Wales and the recently announced plans to build a new pressurized water cooler plant similar to the ill-fated Three Mile Island facility, only 21 miles from Dublin, are state of the art. The danger is that one day one or other could become a glowing testimony to our vulnerability.

Despite repeated protests to the British Government, there is little to indicate to date that the Irish case has impinged much of Whitehall consciousness. As one Irish official put it, they protest long and loud about their industry's safety record, yet steadfastly refuse to locate their nuke plants anywhere near London.

Overtures to Brussels have fared marginally better, in some respects—in line with the EC's determination to raise public consciousness on the nuclear issue throughout the Community.

The Minister for Energy, Mr Burke, does not have much room for movement in the circumstances.

But in the short-term, the minister must seek to implement a number of pressing priorities.

An immediate priority in the light of Mr Burke's strongly-worded protests in the past to the British energy secretary, is the establishment of the long-awaited National Radiological Protection Institute to replace the obsolete Nuclear Energy Board.

To some extent, the delay in bringing in the legislation to set up the Institute has become something of an own-goal for the minister, who laid so much importance on removing a state-sponsored body that apparently empathized to a large degree with the nuclear industry.

The reality is that the staff of the NEB will effectively comprise, for the most part, the staff of the NRPI. The vital change that will be brought about is essentially bureaucratic—enshrined in the Bill to set up the new body. The NRPI will have a new chairman and board. It will more than likely have a new chief executive too as the present supremo, Dr N. V. Nowlan, is due to retire shortly.

The Department of Energy sees no real ambivalence in the new role laid down for the new institute. The old NEB was set up to monitor developments in the nuclear industry when Dessie O'Malley was toying with the idea

of Irish nuclear-powered electricity. The Bill is now at the final draft stage and will, they are confident, have passed through the Oireachtas by Christmas.

It is important that it should—because of the official structure it creates for all public safety initiatives. From henceforth "safety" will be the buzzword for erstwhile NEB scientific officers—not just developments in the nuclear industry.

Secondly, the emphasis that the new body will give to issues of public safety will be complemented by new legislation from Brussels. Its establishment therefore will be timely in the light of the proposed EC Directive on informing the population about health protection measures to be applied and steps to be taken in the event of a radiological emergency.

"Acceptance of the nuclear industry by European Community citizens," says the directive's explanatory memorandum, "depends on their knowing that they and their environment are suitably protected against the dangers of radiation."

The draft directive supplements the existing safety guidelines laid down in Directive 80/836 of the Euratom Treaty and subsequently amending legislation. The purpose "is to provide measures and procedures for informing the population aimed at improving the operational health protection provided in the event of a radiological emergency."

The third priority for the Minister for Energy in the light of these developments is the streamlining of the (singularly low-key) emergency arrangements introduced here post-Chernobyl, to deal with nuclear nightmares.

Some months ago an inter-departmental committee was set up comprising representatives of the Departments of the Taoiseach, Energy, Agriculture, Health, Defence, the Environment, Communications, Foreign Affairs and Industry. It was empowered to set up a plan for nuclear emergencies—to include the following: An emergency control center of key personnel; the quick assessment of incoming information and the relaying of this to the public as well as the provision of a secure system of communications to ensure contact between key agencies and the public.

This third element in the minister's arsenal for dealing with any nuclear emergency is vitally different from previous attempts at crisis management at national level, according to Government sources. The mistakes of the Kowloon Bridge disaster off Cork last year, for instance, where departmental experts were tripping over each other with no one taking overall responsibility, will be obviated by the appointment of a single coordinator who will bring together the different strands of expertise required. He will have full responsibility for monitoring

the efforts of the different departments. His identity has not been disclosed, but it is believed that the committee chairman (the coordinator) will be a senior official of the Department of Energy.

Ironically, in the light of last week's disclosures from the British Nuclear Installations Inspectorate, the Irish emergency plan could be in a much better position to cope with a nuclear emergency than the perpetrators. But there is no room at all for complacency.

The present arrangements in Britain do not inspire confidence. For example, there is no requirement under British legislation to inform the public living near a nuclear plant in the event of a disaster. Local authorities who are legally required to have an emergency plan in the event of other environmental disasters, are not required to have one in respect of a nuclear accident.

The indications are that in Ireland official consciousness of the scale of the problem has increased enormously since the Chernobyl disaster. For all its apparent limitations, the Nuclear Energy Board has at least introduced a scale of technology for monitoring radiation levels previously unknown in Ireland. The equipment, located at 10 vantage points around the country, will be providing the information needed for the new institute—and will be fed directly into a computer at headquarters from the outlying stations. It will mean that up-to-the-minute information on radiation levels affecting sheep or milk, for instance, in any given area of the country can be known.

A certain amount of official satisfaction is evident at the moment at the rate of progress. There is general agreement within the Irish agencies monitoring the British nuclear menace, that the situation is more or less under control—with the exception of Sellafield.

"Sellafield is different," one official conceded. "We do feel there are serious grounds for concern here." The stark problem is the plant's appalling safety record. What is particularly worrying for Mr Burke's department is that the reprocessing plant retains its "convenient" discharge pipe into the Irish Sea. Nobody doubts for a minute where the raw nuclear waste will go in the event of an accident there.

As for a worst possible scenario: Officials in Dublin admit that this is impossible to contemplate in respect of Sellafield. They admit openly they take little comfort from British Nuclear Fuels' oft-mooted statistics about the risks being one in so many millions.

Mr Burke has made repeated overtures to Cecil Parkinson, to little avail. He has also sought to impress on Brussels the importance of establishing an independent inspectorate, possibly under the Euratom Treaty. "Some progress has been made in this regard," officials say "and Commissioner for Energy Clinton Davis, has at least been sympathetic."

More cynical observers maintain that the commissioner's efforts with regard to Sellafield have effectively been diverted by the powerful pro-nuclear Anglo-French lobby, and have wound up in legal quicksand.

In one respect however the EC has been able to take action on behalf of victims of the nuclear industry's chauvinism. This concerns a French power station located near the Luxembourg border. The Euratom Treaty specifies that at least six months notice must be given by nuclear plants before they can discharge nuclear waste into the atmosphere. The French have infringed that. Judgment is due from the European Court any day—and is expected to be favorable to Luxembourg.

So why can't the Irish get the same sort of decision from the EC on Sellafield? Not possible, say the Department of Energy because Windscale (Sellafield) pre-dated the Euratom Treaty—and the EC legislation is not retroactive.

The other awesome task for the Minister for Energy and indeed the entire Cabinet, is the level of nuclear submarine traffic in the Irish Sea.

There is little that can effectively be done about this—because of the fact that Ireland is not a world military power. In effect, any protests are ignored. It's a prospect that does not bear thinking about for people living in the Eastern conurbations—with PWR (Three Mile Island type) powered subs racing round our shores.

One minor comfort can be taken from the proposed legislation to set up the new NRPI. The regulations accompanying the act can stop "courtesy calls" from nuclear-powered vessels to any of our ports.

That's one the anti-nuke lobby will be watching with interest.

07310

Nuclear Link to UK Threatens Irish Neutrality
51500008 Belfast NEWS LETTER in English
28 Aug 88 p 4

[Text] The Republic has set up nuclear links with the RAF in a move which could threaten Irish neutrality.

A spokesman for the Department of Defence in Dublin yesterday confirmed that such links exist. But he denied that they had been kept secret.

Last week the international air magazine Flight reported that the South's security forces were linked into the UK nuclear warning system.

The network, known as WB 400, extends from RAF Fylingdales early warning station in Yorkshire.

The system is controlled in Northern Ireland from the UK Warning and Monitoring Organization HQ at Thiepval Barracks in Lisburn.

An underground bunker there near Army HQ acts as a doomsday headquarters.

An Irish Army officer confirmed yesterday that the Observer Corps in the South has links with Lisburn.

He said the Observer Corps was staffed by full time Irish soldiers.

Barracks

It has its headquarters in Custume Barracks, Athlone.

The big military barracks in the midlands town has a command and control nuclear shelter similar to the Lisburn bunker.

There has been some embarrassment in Dublin at the report in Flight magazine.

The official line is that such links are normal and necessary.

A statement from the Department of Defence said: "There are, of necessity, contacts between Irish Civil Defence and similar organizations abroad to secure information on nuclear bursts and fallout patterns which is vital to its role of protections of civilian lives in wartime."

The statement says that the contact had "no military significance."

News that the Republic is linked in to the UK nuclear network comes as work is being completed on the first of three nuclear bunkers in Northern Ireland.

07310

TURKEY

15-to-20-Megawatt Nuclear Reactor Planned for Ankara

TA1610151888 Ankara ANATOLIA in English
1445 GMT 16 Oct 88

[Text] Ankara (A.A.)—A 15-to-20-megawatt nuclear reactor is to be built in Ankara by the Turkish Atomic Energy Institution (TAEK) for experimental purposes.

The construction of the nuclear reactor proposed for the 1989 national investment program has been ratified by the technological department of the State Planning Organization, a top TAEK official said.

President of the TAEK Dr Atilla Ozmen told A.A. that this prototype project was to introduce a new technology to Turkey and that it had no commercial purposes.

Dr. Ozmen added that so far no choice has been made regarding the type and the location of the nuclear station and that the most productive and cost-efficient type would be preferred.

The estimated cost of the installation is \$25 million.

UNITED KINGDOM

Radioactive Contamination of Irish Sea Protested

Revelations From Greenpeace

51500007 Belfast NEWS LETTER in English
10 Aug 88 p 12

[Text] The Irish Sea is the most radioactively contaminated sea in the world, it was claimed yesterday.

Greenpeace, the ecology group dedicated to fighting pollution, highlighted the Sellafield nuclear power plant in Cumbria yesterday as the main source of pollution.

The organization's flagship, Moby Dick, arrived in Belfast for a two-day campaign to lobby politicians over levels of radioactive and chemical pollution.

A Greenpeace spokesman said: "The Irish Sea is a small, shallow waterway. Areas if it are at least as polluted as the North Sea, yet no environmental controls are being implemented to protect its wildlife.

"Already high levels of fish disease are being reported, and in many areas shellfish are unfit to eat and seabirds have fled their natural breeding grounds."

Greenpeace said the Irish Sea was a vitally important ecosystem supporting a massive array of flora and fauna which was now threatened by uncontrolled dumping of waste.

Highlighting the pollution, Greenpeace revealed that:

- Between a quarter and half a tonne of plutonium has been discharged into the Irish Sea from Sellafield. This discharge, together with those from many other nuclear installations, has made it the most radioactively contaminated sea in the world.
- The Irish Sea is heavily contaminated in certain coastal areas with synthetic materials and heavy metals.
- Millions of tonnes of untreated sewage and industrial waste are dumped into the Irish Sea every year.

Greenpeace said numerous studies had shown that there was a high incidence of leukemia and other radiation-linked diseases on both sides of the Irish Sea.

Waste From UK Reactors

51500007 *Belfast NEWS LETTER in English*
15 Aug 88 p 7

[Text] Dumping nuclear waste in underground caverns in the Irish Sea has been branded as "absolutely criminal" by South Down MP Eddie McGrady.

He said: "Although it is only a proposal at present, I am concerned that with many big nuclear reactors coming out of commission in the United Kingdom there will be pressure to find somewhere to dump the waste."

The geological fault in the Irish Sea bed [as published]

"Nuclear waste should be stored on a land-based site which must be readily accessible for monitoring and remedial action," said the MP.

He also expressed concern, after meeting members of the environmental group Greenpeace, at the increasing transport of nuclear waste up and down the Irish Sea.

"All of this adds weight to the case put forward by the SDLP to work towards the cessation of nuclear and toxic wastes being brought into the British Isles from abroad."

07310