



ANUMUKTI

A JOURNAL DEVOTED TO NON-NUCLEAR INDIA

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BARC AND BYTE

Some representatives of voluntary organisations in Bombay had submitted a memorandum to Dr.M.R.Srinivasan, chairman, Atomic Energy Commission, on Hiroshima day last year. The memorandum discussed issues arising out of environmental hazards of nuclear power plants; a large number of accidents that have already taken place in nuclear industry worldwide; the grave threat posed by radiation not only to present but also to future generations, the people who had been displaced out of their ancestral lands and finally the economic viability of nuclear energy.

They requested the government:

"To stop setting up nuclear power stations till a national debate covering all aspects of the use of nuclear power is held."

"To scrap Section 18 of the Atomic Energy Act of 1982 so that information regarding nuclear power plants, instead of being kept a closely guarded secret is given to the public, consistent with the inherent right to information which has to be guaranteed to every citizen in a democracy."

"Not to dub those who raise doubts about nuclear power as traitors or foreign agents."

The reply to this memorandum has been penned by Shri Vittal. He is presently Additional Secretary, Department of Atomic Energy (DAG). We are reproducing his reply in full just to give an example of the

Bombay Sarvodaya Mandal. While I appreciate the interest you and other organisations have shown in our activities, I find that the memorandum contains a number of statements which are not factual or scientifically correct. Before I come to answering the points raised in your memorandum, I wish to present the following facts for your information:

Contrary to what is stated in the memorandum, Nuclear Power Plants (NPP) have been proved to be benign to the environment and do not cause any ecological imbalance. One of the important components of the environmental protection policy adopted by the DAE is that DAB operations shall not disturb the ecology of the nature in whatever manner detrimental to the ecosystem. A constant watch is being maintained through the environmental survey laboratories located at each site. These laboratories provide surveillance around the facility up to 30 kms. distance.

Comment

Almost a quarter million Soviets are living on land so contaminated by the Chernobyl accident that they must receive special food supplies to avoid overexposure to radiation, says Pravada. The Communist party daily printed maps showing contaminated areas of Byelorussia, the Ukraine and the Russian republics, in response to the readers' complaints that they did not have full information even three years after the accident. The area where the current level of radiation from the environment and food supplies would expose residents to a lifetime (reproductive - 30years) dose of more than 35 rems, comprises more than 10,000 square Kms. It includes 640 settlements with 230,000 people.

(Times of India 22.3.'89)

The International Council for Radiological Protection (ICRP) presently recommends an average dose for a member of the general public of not more than 5 rems per 30 years. Even this has been criticised as being too high and the ICRP is in the process of reducing this limit further. For the Soviet Union to tolerate limits seven times higher just shows their helplessness in face of the severity of the contamination. Even with limits so relaxed, an area as large as 10,000 square Kilometres has to be essentially 'written off'. To call a technology capable of producing such havoc as "benign to the environment" is benighted to say the very least.

In the Indian context there is only one agency which sets up nuclear establishments, decides how their pollution is to be measured, carries out the actual measurements, interprets the results, evaluates its own performance and finally pats itself on the back for its 'cleanliness'. In the absence of any public accountability and independent critical evaluations, DAE's contentions are untenable.

Letter

It is also wrong to say that trees have been felled at various locations where NPP are proposed to be set up. On the other hand DAB has been spending money to develop the green belt around our installations. In fact, today, clearances from the Department of Environment and Forestry are a must before starting any new project.

Comment

The objection to felling of trees is made with special reference to Kaiga Nuclear Power plant. Raiga is located in the midst of one of

the few remaining bits of tropical rain forests left in the country. Experience all over the world has taught us that the rainforest is a very fragile ecosystem and assaults on it in the form of human intervention are likely to destroy all of it. Harping on the green-belt 'created' by the DAE is to miss the woods for the trees.

Letter

It is not clear how you have concluded that 4,000 accidents have taken place in NPP's around the world including 300 in India. It is not also clear how these accidents have caused great danger to the present and future generations. I would like to point out that nuclear power has been in use for more than four decades and today there are 400 operating reactors in 26 countries producing 300,000 MWs of electricity which forms 16% of the world's total electrical installed capacity. Four major accidents have taken place since the beginning of nuclear power generation four decades ago. These are:

- (i) Windscale accident in the UK in 1957
- (ii) SL-1 accident in the U.S. in 1961
- (iii) TMI-2 accident in U.S. in 1979
- (iv) Chernobyl-4 accident in U.S.S.R. in 1986

Comment

The word needs to be spread around our nuclear establishments that the incident at Three Mile Island should be treated as a 'major accident'. Dr.P.K.Iyengar, Director of the Bhabha Atomic Research Centre (BARC), speaking at the Bangalore Science Forum in September '88 had informed the public that TMI - 2 was not an accident at all, because, you see, "no one died there!" Dr.Raja Ramanna, former chairman of the Atomic Energy Commission (AEC) also needs to be informed that Chernobyl needs to be treated as a 'major' nuclear accident. He is under the impression that Chernobyl was not a nuclear accident at all, but a "curious fire accident". (Bulletin of Sciences, a publication of Indian Institute of Science, Bangalore, August/September '88)

The figure of 4000 accidents in NPP's around the world is, in fact, a very conservative estimate. Every year several thousand 'unusual occurrences' are reported to the Nuclear Regulatory Commission (NRC) in the U.S.A. alone. In the four year period from 1980 to 1983, 744 events were considered particularly 'serious' by the NRC. Contrast this with the system in India where unusual occurrences, accidents number of forced SCRAMS, their reports, in short everything is kept safely away from public scrutiny.

Major nuclear accidents need not always be sharply defined single events. The military plant at Hanford, USA or our own thorium processing plant at Alwaye in Kerala have been continuously polluting the water sources for years. Radiation effects on living tissues are cumulative. The damage to public health and to the future generations will be done whether the radioactive pollutants are released into the environment in a single shot or distributed over decades.

Any list of major nuclear accidents which does not include the disaster near Ryshtym in the Soviet Urals in 1957 can not be called complete. Even official Soviet media have admitted to the occurrence of this disaster which severely contaminated an area of 300 square miles and required the evacuation of 10,000 people. More than 30 years after the event lakes in the region are still contaminated.

Letter

In the Windscale and TMI-2 accidents there were no fatalities. In the other two accidents the fatalities were only those who were working in the plants. No neither of the public has ever died in a nuclear accident. I must also point out that with our present knowledge there has been no evidence of genetic abnormalities due to radiation seen in the human population. This conclusion is based on extensive studies on human populations including the Hiroshima and Nagasaki victims.

Comment

It is absolutely shocking to find statements like "No member of the public has died in a nuclear accident" still being made by responsible members of the atomic energy establishment. It is a display of the total lack of sensitivity towards the pain and suffering of the victims of nuclear industry. It is similar to tobacco industry apologists claiming that nobody has ever died of cigarette smoking since anybody who dies does so from heart attacks, respiratory failure, lung cancer etc. Deceitful statements like these are probably responsible for the very low credibility of nucleocrats.

It is universally accepted that radiation does cause genetic damage. The major evidence for this has come from animal studies especially on mice. The apparently reassuring absence of genetic damage in Hiroshima - Nagasaki studies needs to be viewed with caution. It is possible that an increase in severe mutations leading to miscarriage was masked by the high natural spontaneous miscarriage rate. Also, those mutations not leading to an early death of foetus would be likely to be recessive in character, that is abnormalities may not become apparent for several generations."

Radiation and Health: Dr.H.Dace

Letter

In the DAE, safety of NPPs is under constant review with a view to improving the safety status further with new developments. Following the TMI-2 accident a comprehensive review was conducted. After the Chernobyl accident we have made yet another review of the safety status of our plants.

It was concluded that our PHWR design has inherent safety features much better than other type of reactors.

Comment

To call the CANDU design as 'our PHWR design is something of a plagiarism. However, India is presently in the process of becoming the proving ground of various kinds of reactor designs from BWR (Tarapur) to CANDUs (Rawatbhata, Kalpakkam, Narora...) to Russian VVERs (Koodankulam) to French PWRs (?) Each reactor design has different safety features and hence accidents in a particular type don't contribute much to the understanding in a different type, except the crucial observation that catastrophic accidents result when the design faults are accentuated by operator failings. Thus statements like, "Our reactor designs have inherent safety features much better than other types" are irrelevant. None of the reactor types operating anywhere in the world or under construction presently are 'operator proof'. Each have different safety hazards. We have already discussed the safety features and the hazards of the CANDU design in the very

first issue of Anumukti.

Letter

We know that exposure to ionising radiation does involve a small risk of cancer. There are many other chemicals, particles and agents in the environment which also cause cancers. It is only in the case of ionizing radiation that a systematic study has been carried out right from the beginning. This in depth study has not been undertaken in any other industry.(e.g. Chemical Industry) It is this knowledge which has helped us to achieve a defence-in-depth philosophy of safety in all nuclear installations. As I mentioned earlier genetic effects have not been seen in the human population; these are however, included in our risk assessment as a measure of abundant caution. I must point out that there is no human activity which is totally free from an element of risk. Because of Several beneficial effects of radiation, it is perhaps worthwhile for all of us to take a very small risk. It is this philosophy that has pervaded our safety practices.

Comment

Workers, military personnel and the general public have been given the impression that exposure to radiation involves a slight risk of cancer and that one's chances of escaping this are better than the chances of escaping an automobile accident. The probabilities of early occurrence of heart disease, diabetes mellitus, arthritis, asthma or severe allergies - all resulting in a prolonged state of ill health - are never mentioned. Most people are unaware of the fact that ionising radiation can cause spontaneous abortions, still births, infant deaths, asthmas, severe allergies, depressed immune systems (with grater risks of bacterial and viral infections) leukaemia, solid tumours, birth defects or mental and physical retardation in children.

(Ho Immediate Danger: Dr.R.Bertell)

It is perhaps worthwhile for all of us to take a very small risk." Perhaps Mr.Vittal, but who decides? You or the villager involuntarily living near a nuclear installation. The crux of the matter is that this 'small risk' is not shared equally by all.

Letter

It is incorrect to say that thousands of people have been uprooted at nuclear power station sites. Statistics show that the land needs for an NPP is only 0.3 X to 0.4 X of that needed for a hydel project. Even coal based power stations need more land than NPPs. The number of people displaced in an NPP project is also very small.

Comment

The statistics that an NPP takes only 0.3% to 0.4% of the land that is needed for a hydel project leaves me thoroughly confused. Official DAE documents claim an exclusion zone of 5 kms around an NPP for safety reasons. By elementary mensuration, this works out to be nearly 7,850 hectares. In case of Kaiga this is more than 1100X of the land submerged in the reservoir of the 240 MW Sharavati Tail Race hydel project also being undertaken in the North Canara district.

Letter

A detailed analysis of the thermal and nuclear power costs by an expert committee consisting of representatives of various departments

of the Government of India as well as representatives from the private sector has clearly shown that nuclear power is cheaper than thermal power taking into account the transport of coal from the mines to the power station site as is being done at present. Further, in the nineties nuclear power will be competitive with thermal power even at the pit heads, Incidentally I must mention that Tarapur Atomic Power Station has not been decommissioned and still it is supplying 320 MW of power to Maharashtra and Gujarat. Today, Tarapur power is the cheapest non-hydel power.

Comment

Installation costs of nuclear power plants have skyrocketed everywhere. As an example, even the official figures reveal that the Narora reactor has cost around a hundred times more than the Tarapur reactors. Similarly, operating costs too have gone through the roof. This is due to the fact that many new safety features have had to be added-on following nuclear disasters elsewhere. Thus it is not clear to me that how this 'high' powered committee came to the conclusion that "During the nineties nuclear power will be competitive with coal even at the pit heads." Is it a reflection on the incompetence of the coal based thermal power people? Or, is it that in the interest of 'cheap' nuclear power safety considerations have been given the back seat? If in fact, operating costs are becoming less in India while they are shooting up in the rest of the world, this fact ought to be publicised far more. We can export this 'knowhow' to other countries specially to the so-called industrially advanced nations who are not so 'smart'.

We are aware of the costing exercise conducted by the expert committee which concluded that nuclear power is only marginally cheaper than coal far away from the pit heads. We are also aware of the following:

- (i) The cost of decommissioning NPPs and of waste storage is not accounted for. Decommissioning costs are presently estimated to be at least 50% to 100% of the construction costs, but in our budget they are shown as being less than 1%.
- (ii) The Comptroller and Auditor General's office has pointed out that the heavy water costs have been manipulated to an extent that less than 30% of the true cost is reflected in the accounting,
- (iii) During the National Workshop on Nuclear Energy, Dr.A.K.N.Reddy had shown the several juggleries carried out with interest rates so that lower costs could be presented.

Letter

It is not true that the U. S. has either stopped commissioning of new nuclear power plants, or phasing them out. In the United States as of December 1987, there were 106 reactors producing 93,000 MW and four units under construction with a capacity of 2,500 MWs. In the USSR, 56 reactors are operating with 33,600 MW and 28 reactors are under construction with a capacity of 28,000 MW. In fact, after Chernobyl, USSR has developed an improved version of the RBMK reactor. Only Austria has decided not to operate a nuclear power plant after completing construction. Given the small population and adequate resources it could afford to take such a step. It could also obtain gas or electricity from neighbouring countries.

Consent

The article, "Beneath the Veneer of Progress - a Sick Industry**" in the last issue (Vol 2, No. 2, 3) of Anumukti documents in detail the sorry state of nuclear industry in other countries. It is in fact this terminal illness of the nuclear industry in its home markets which has led to the state of irresistible offers to third world countries such as India. The illustrative though not exhaustive list would have become more illuminating if it had included mention of countries such as Yugoslavia, where a law has been passed banning any further nuclear construction or Italy where 80% of the people have rejected nuclear power in a referendum. The list could have also gained from a mention of countries such as Sweden, Denmark, Finland, Greece and Philippines who have all been rethinking their commitment to nuclear programmes.

Letter

Taking into account the above facts which are not exhaustive but only illustrative, it is clear that there are many inaccuracies and mistaken notions in your memorandum based on wrong information and that this wrong information is apparently responsible for your three demands. The position regarding these demands is as follows:

1. Stop setting Up Atomic. Power Stations at least till a National Debate is held;

Starting with the commissioning of the first atomic power station in 1969 at Tarapur, nuclear power plants have been operating for 20 years. Our safety records in respect of safety of operating personnel the public and the environment have been excellent. All aspects of atomic energy including safety and economic aspects have been described in open documents. Being a Government organisation, the DAB is subject to review by the parliament committees as well as Members of Parliament. In every parliamentary session, a large number of questions covering all aspects of atomic energy are being answered over the years. In my view, this itself forms a major debate through the democratic channel, and therefore, I do not see any reason to stop setting up power stations and thereby denying much needed electrical power for the development projects in the industrial as well as the agricultural sector.

Comment

What are issued in each session of parliament are self-congratulatory platitudes by the ABC. Most of our MPs are ignorant of the true hazards of nuclear power and the lack of environmental ethics involved in its generation. To call what transpires in the parliament as a "major debate" is a travesty. And, as per the 1962 Atomic Energy Act, the DAB is not even answerable to the parliament.

The only true debate on the NPPs was the one sponsored by the opposition ruled government of Karnataka. A debate where the nuclear establishment was thoroughly exposed, out a sorry figure, and where you, Mr. Vittal made the remarkable statement that "the era of secrecy has ended in the ABC." If your letter is any indication of the future the era of disinformation is just beginning.

Letter

2. To Scrap Section 18 of the Atomic Energy Act:

There is no need to scrap Sec.18 of the Atomic Energy Act as it is required in the interest of national security. As mentioned above all

relevant information is being provided to the public through the answers to the questions raised in parliament.

Comment

What Section 18 of the Atomic Energy Act protects is not national security but the fact that nuclear power has been as colossal a failure in India as elsewhere. What is denied by this act is public accountability

Letter

3. No dubbing of those, raising doubts about nuclear:

To my knowledge no such dubbing has ever been done.

I hope that the above facts, clarifications and answers would be of some use to you to get a clear picture and appreciate the important contributions of nuclear power to meet the ever increasing demand of electricity in the country.

Comment

Antinuclear activists have been dubbed unpatriotic by none other than Dr.Raja Ramanna, the former chairman of the ABC. The harassment of nuclear critics has been going on for a very long time. The case of Dr.Dhirendra Sharma is an illustrative example.

I personally welcome Mr. Vittal's statement that no dubbing has ever been done, as an expression not of past practice but of future intention. It is the first prerequisite which all of us must adhere to in order to raise the level of the nuclear debate.

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CALCUTTA CONVENTION ON NUCLEAR POWER

A convention on 'Nuclear Power and its Acceptability' was held in Calcutta on 30th of April, '89. The day long meet was attended by about 250 people. Amongst the audience were many distinguished academics, civil servants, artists and theatre personalities, engineers, doctors and social activists. The atomic energy establishment sent three representatives. They were Dr. A. K. De, the chairman of the Atomic Energy Regulatory Board; Dr. Bikash Sinha, the chairman of the Variable Energy Cyclotron project and Dr. L. Krishnan from the reactor safety unit at Kalpakkam. As has by now become commonplace these worthies were comprehensively outdebated by the antinuclear spokespersons who included Dr. Dhirendra Sharma of JNU, Dr. S. Jana from the Institute of Public Health, Dr. S. Basu of Jadavpur University and Dr. S. Gadekar of Anumukti. Many issues, particularly those of social justice and public accountability of nuclear power were well articulated in the inaugural session by Dr. Sujit Das, Shri Amlan Dutta and Shri Ashok Mitra. During the afternoon session, many common problems encountered by activists were discussed. The convention, the first of its kind in the eastern regions of the country, was the result of untiring efforts by many volunteers. Particular mention must be made of Shri Pradeep Dutta and Dr. Sujit Das.

SHADOWS OVER SRILANKA

As little as a year ago, Sri Lankan intellectuals used to shrug their shoulders when the nuclear issue was raised - "of what concern is it to us? Kalpakkam is hundreds of miles away." But after the signing of the agreement to import two Russian built reactors by India, the situation has begun to change here as well. The prospect of having two large nuclear reactors at Koodankulam just off Sri Lanka's coast is disturbing.

The Shadow Region

On February 1st, 1989, inspite of the ongoing civil war and the hectic election campaigns, some people got alert when the large daily The Island published an article about Sri Lanka's radiating future and commented on it editorially. The paper was alarmed especially by a statement that "Koodankulam lies in the shadow region of Sri Lanka", made by the project director V.S.G.Rao in a seminar at Madras University and carried by The Hindu on January 29th 1989. Rao also said that cyclones would not affect the plant and that seismic studies show that it's rocky foundations are safe.

The Sri Lankans are mainly concerned about the safety of the reactors. Since Indian nuclear technologists have had no previous experience of operating plant of this type and of such large size, they tend to disbelieve their assurances regarding safety.

But they.. are also concerned about other issues. Besides environmental concerns' and questions about waste disposal, they are especially suspicious of India's claim that the nuclear programme serves an entirely peaceful purpose: they see it in the context of the development of India's 'Agni' missiles of intermediate range. Sadly but truly, public opinion in Sri Lanka does not see India as a peace loving neighbour.

IAEA Inspection Demanded

The Sri Lankan demand to ask for an IAEA (International Atomic Energy Agency) inspection of the plants, though understandable in this perspective, is nevertheless, strange. IAEA's own involvement in the promotion of nuclear industry is well known and should not be overlooked.

Sri Lanka joined the IAEA in the 1950's and on its recommendation formed its own national Atomic Energy Authority (AEA) in 1969. Since then, IAEA has helped Sri Lanka in the establishment of several "beneficial" products of nuclear industry like the nuclear imaging centre at the Colombo hospital. Besides medical research, it has also helped in spreading nuclear techniques in the fields of archeology, food preservation and in various branches of industry.

AEA chairman Dr.Granville Dharmawardhane sees IAEA's role as a much needed corrective in international nuclear affairs. Nuclear energy, according to his, may reduce or widen the gap between rich and poor countries. As industrialised countries tend not to share

their knowledge in this field with other countries in order to protect their own economic interests, and as the developing countries absorb new technologies only slowly, the IAEA comes into help. It was only due to IAEA assistance, he says for example, that the Radio Isotope Centre at Colombo University was established.

The Man Who Needs Watching

But Dr. Dharmawardhane's aims go far beyond the use of nuclear techniques in industrial investigations or medical research. That is only the first step, to be followed by the creation of a nuclear research facility and reaching its ultimate objective in the use of nuclear power reactors. The fuel for fulfilling his dreams, he hopes to obtain from seawater. (Nuclear News Bulletin of AEA, July '81; Daily News 26.3.'85 and 24.12.'88).

Very euphoric portraits of Dr. Dharmawardhane already started appearing in Sri Lankan papers as early as 1980. In one he was described as "the man who is to be watched, for nuclear applications are dawning on us with a big bang!" (Daily News 26.11.80)

Plans shelved

While nuclear power generation was not considered feasible in Sri Lanka in the early 1960s, the issue cropped up again in 1980. That year President J.R. Jayewardene appointed a committee of experts to report to him regarding the feasibility of nuclear power generation in the country. The recommendations of these scientists not to build a nuclear power plant this century and public protests influenced him to shelve the idea.

Dr. Dharmawardhane is however, not sitting idle. His own group of experts recommended in an 82-page report the construction of a nuclear power reactor in Sri Lanka by the early 1990s. (Sun 10.1.'81) While the island republic was struggling with other problems, interested circles have never remained totally silent about their plans to press for a nuclear future.

Among them is Hr. Aelred Fernando, Director, Energy Planning in **the** Ministry of Power and Energy, a man who had part of his education with the help of the IAEA. Mr. Fernando hopes to create a core group of scientists who by the year 1994 could undertake a new feasibility study for the establishment of a nuclear power plant going critical by the year 2004 AD (Daily News 12.9.'86)

Creating a Lobby

At Moratuwa University near Colombo, a large number of electrical, electronics and mechanical engineering students have already specialised in nuclear engineering. Between 1983 and 1985, the output was estimated to be about 100 trainees. (Sun. 22.2.'85) Although these people are supposed to find employment in existing institutions where nuclear techniques are already in use, "one cannot escape the feeling that this could well be the lobby that would clamour for nuclear power," as Mallika Wanigasundara remarks. (Daily News 12.9.'86)

The Indian army sponsored Provincial Council government in **the** north and east of the island in the beginning of this year also decided to investigate into the possibilities of building a nuclear power plant in this area of its influence. The government is under pressure from environmentalists protesting against the building of a thermal power plant near Trincomalee. A nuclear plant would also **make**

the north and east more independent of the hydroelectric power now produced mainly in the central province.

On the same day that Sri Lanka discovered the "Nuclear Danger from Tamilnadu" (The Island 1.2.'89), a whole page advertisement appeared in the same paper, describing the new Siemens 'gamma camera' installed at the Nuclear Imaging Unit of the Colombo General Hospital. Whether ultimately Sri Lanka does or does not 'go' nuclear, it is already a ready market for the 'beneficial' byproducts of the nuclear industry.

"Protect Waters, Protect Life March

On May 1st, the Kanyakumari police sprayed bullets on the demonstration organised by the National Fish Workers Union to draw national attention on the question of water, which is becoming scarcer and dirtier, thanks to the wrong development policies. The march, which began simultaneously from Calcutta and Bombay on 1st April converged at Kanyakumari for a colourful Hay Day demonstration and an evening public meeting which was to be addressed by Justice VR Krishna Iyer, Tom Kochery and Mathias Saldhana.

This is the first instance of a trade union giving a call to focus national attention on an environmental issue which affects the whole population. The marchers identified and campaigned against 19 monsters which include the Baliapal missile launch site and atomic power plants at Kaiga and Koodankulam.

Most of the over 10,000 participants (7,000 women) came from the coastal villages of Kanyakumari, Tinneveli and Tuticorin of Tamilnadu. The participants from Tamilnadu and Kerala expressed their determination not to allow construction of nuclear reactors at Koodankulam in Tinneveli district of Tamilnadu.

Immediately after the firing the police disconnected the public address system thereby preventing the organisers from addressing the people. The public meeting to be held was declared unlawful. Several environmental groups have asked for a judicial probe in to the incident.

According to the official version, an internal squabble amongst the marchers led to police intervention followed by stone throwing by the marchers. Independent investigations reveal that there was an organised attempt to disrupt the march.

Public participation in the demonstration was by all accounts beyond even the wildest dreams of the organisers. There were more than double the number of people who had gathered in Kanyakumari to hear the Prime Minister during the recent election tour.

LAST RITBS FOR ATOMIC ENERGY?

Members of the Citizens for Alternatives to Nuclear Energy and other activists held a protest programme in Bangalore on 26th April. Dr. B.C. Ramachandra Sharma, Dr. Sumatindra Nadig and Dr. D.R. Nagaraj addressed a public meeting held on the occasion.

Later the activists took out a procession to the Nuclear Power Corporation office and submitted a memorandum demanding stoppage of work at Kaiga. The NPC officials conceded the activists' demand for closing down the office in memory of all the victims of radiation and downed shutters for the day.

Interview with John Goffman

Dr John Goffman is the Professor Emeritus of Biophysics and Medical Physios at the University of California, Berkeley; He was formerly associate director of the Lawrence Livermore National Laboratory; as a graduate student he was the co-discoverer of uranium-233;He has authored several books including Radiation and Human Health(1981), X-Rays: Health Effects of Common Bxams(1985) and RadiationInduced Cancers from Low-Dome Bxposure(1989)

Several reporters have been asking me about a revival of power because of worries about the greenhouse effect. Here answers to some of the most common questions.

nuclear
are- my

* "Given the Greenhouse effect, would you still oppose power if an inherently safe reactor could be designed as protagonists claim they can do?

nuclear
nuclear

YES, I would still oppose nuclear power. ,

Havn't they been claiming that the present designs are safe too? But the truth was stated very well by Dr.Nunzio Palladino, who was the dean of the Pennsylvania Stats College of Engineering before he became the chairman of the U . S . Nuclear Regulatory Commission (NRC) In a sworn testimony on August 21, 1970 before the Pennsylvania State Senate, Palladino said: "Though we can generally tell when we have a very unsafe reactor, it is always hard to know how safe you are with one you believe to be safe."

A recent example in a long series of nuclear engineering 'surprises' occured at the La Salle plant near Chicago. The New York Times reported July 10, 1988: "A huge oscillation in the speed of a nuclear reaction at the La Salle plant has prompted an inquiry into whether a whole class of nuclear plants are vulnerable to a dangerous condition that engineers had predicted was impossible to occur ..."

The problem is not Just surprises. The nuclear record reeks from cover-ups of RECOGNIZED safety problems. And beneath it all, you have got engineers thinking their designs incorporate an "acceptable" margin of safety based partly on a severe underestimates of the cancer hazard if their designs fail. And on top of that, you have got reactors which grow more radioactive, less approachable by humans and more like brittle glass-jars as they operate. The ultimate hypocrisy of safety claims is revealed when representatives of the nuclear community try to con the public into believing that containment structures will prevent catastrophic accidents, when they clearly do not believe it themselves. They keep proving that radiation disasters can happen by pressing for liability limits on radiation disasters which they claim are IMPOSSIBLE!

Given the record of broken promises, 'surprises', cover-ups deceptions and hypocrisy, I think a person would have to be very very naive to rely on any current claims about a breakthrough in safety.

* " So you don't believe that there is an inherently safe reactor coming along?"

Recall the warning from Dr.Palladino. Host of all, realize that radiation disasters can happen in the absence of spectacular accidents. Let us consider some very simple arithmetic:

The radioactive cesium-137 produced each year by a 1000 MW nuclear power plant amounts to nearly 4 million Curies. Since its radioactive half-life is 30.2 years, very little of it decays during a year.

According to Soviet estimates, the Chernobyl reactor contained a two year cesium inventory of about 8 million Curies. After the accident about 1 million Curies were deposited within the Soviet Union. Approximately another million Curies were deposited outside the Soviet Union in Europe. Combined that amounts to about 25% of its two year inventory, which is the same as 50% of the cesium-137 produced by one year of operation.

Now, let us consider 100 large nuclear plants that are presently operating in the U.S.A. for a life span of 25 years each. Call 'A' the yearly cesium-137 production by one plant.

Then $100A = \text{Yearly production by 100 plants}$

Lifetime production = $25 \text{ Years} \times 100A/\text{year} = 2500A$

99.9% containment = loss of 1 per thousand

With 99.9% perfect containment, loss = $2.5A$

Chernobyl's loss = $0.5A$ and hence ratio = $2.5A/0.5A = 5$

This ratio, 5, has an enormous meaning. It means that even achieving 99.9% PERFECT CONTAINMENT of the cesium-137 produced by 100 presently operating plants during their 25 years of operation, through all steps of the cesium's handling up to the final burial, would still result in a release equivalent to 5 Chernobyl accidents. This assault on human health would occur without blowing the roof off any single plant. Worldwide there are about 400 plants underway, so that the same scenario (99.9% success in containing cesium) would mean cesium loss equivalent to 20 Chernobyl accidents per 25 years of operation.

Radio-cesium is far from being their only poison. Nuclear power plants produce the same variety of poisons as do atomic bombs. During each year of operation, each plant produces radioactive poisons equivalent to about 1,000 Hiroshima A-bombs, PERFECT containment is essential.

In addition to the fission products there is radon. Extra radon poison is necessarily released during the process of mining uranium. Radon comes from the decay of the thorium-230 left in the 'tailings'. In my 1981 book I have shown that fuelling 1,000 plants would release enough radon to cause 450,000 fatal lung cancers for each year that those 1,000 plants operate. These deaths would not be imposed on ourselves. They would occur over many thousands of years among our descendants. Nice legacy.

* "So you are saying that the poisons are going to get out, even if we prevent spectacular accidents?"

You bet I am. Not just radon. Fission products get out in the endless series of small leaks, burps, and spills which we hear about. Nuclear pollution requires nothing spectacular. Just the commonplace: leaky pipes, mistakenly open valves, faulty O-rings, cracked cement, stuck needles in a dial, human carelessness and even people literally asleep at the switch.

Fission products are also getting out by INTENTION: the so called "permissible" releases. Today even scientists at the very heart of the radiation community are finally warning that ionising radiation is about 11 times more carcinogenic than they previously admitted. (My independent analysis shows the hazard is worse than that.)

Nonetheless, the Nuclear Regulatory Commission (NRC) proposes to designate certain low level waste "below regulatory concern", and to

let it go straight into local dumps. And accumulate there. NRC admits some of it might get into people via air and water, but claims the cancer hazard won't exceed "permissible" rates like 1 case per million people. Such proposals, like all other "permissible" releases to the environment, are based on denying the true toxicity, and using dubious data on transport in the environment and promoting the doctrine that it is morally "acceptable" to cut our own costs by contaminating the planet for future generations.

With that kind of moral code, I see no barrier against steps towards the following scenario: You have a nuclear facility with vents and pipes for the "permissible releases" to the environment. Each exit is monitored by a meter, whose threshold for detection can be set at various levels. If you design enough vents and set the detection threshold high enough, *you* could release up to 100% of your radioactive poisons and still produce a monitoring record which says that you released ZERO.

If the nuclear community claims that releases from nuclear - power plants cause an average dose below a millirem per year, or that radioactive poisons will be contained to one part per million or whatever, deep skepticism is the appropriate response. It's been earned.

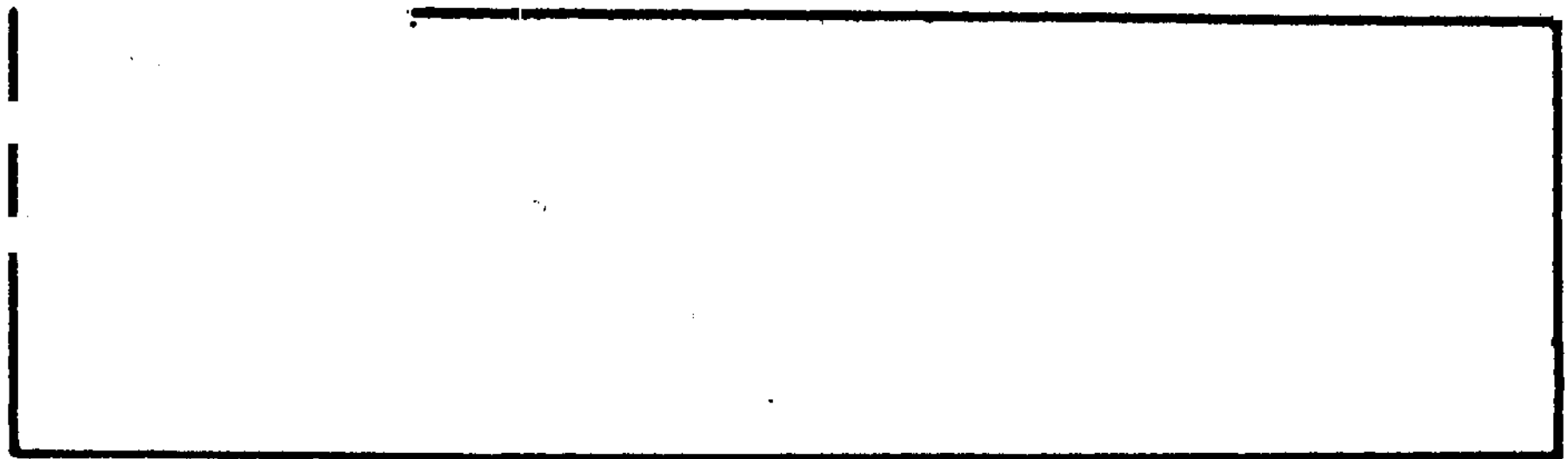
* "So your opposition to nuclear power is based on a deep distrust of the industry?"

The very nature of nuclear power makes it unacceptable, even under a better moral code. I oppose it because it creates astronomical quantities of radioactive poisons which will remain toxic for hundreds and sometimes thousands of years. These poisons cannot be reduced, they cannot be detoxified, they cannot be recycled and they are non-biodegradable. They decay, at their own immutable rates. Even when they are contained, they cannot be disposed off at all - they can only be moved from one location to another,

Ionizing radiation which is the hazard from these poisons, is definitely one cause of heritable genetic mutations and chromosome injuries. When exposures occur after conception, in utero, one of the proven hazards, is mental retardation.

Furthermore, ionizing radiation is not just one entry on a long list of SUSPECTED causes of human cancer - it is one of the few PROVEN causes. In fact it may be the only one where proof now exists that there is No harmless threshold dose or dose-rate. Every bit of exposure adds to the rate of human misery for sure.

So, I have no choice but to regard nuclear power as a loony, demented choice, and a real crime against all our descendents. I have



said enough.

Welome CANE HEWS

A six page antinuclear newsletter from Citizens for Alternatives to Nuclear Energy (CANE) has started publication from Bangalore. The purpose of the newsletter is to "place on record with appreciation and gratitude, the efforts of thousands of people as well as to inform well wishers all over the country of what is actually happening at Kaiga." The appearance of the newsletter is an indication of the strength of the movement against nuclear power in Karnataka. Anumukti sincerely hopes that CANE NEWS will grow from strength to strength and be the forerunner of many such publications from different parts of the country.

Address: CANE, 809, 17 Main, 5th Block, Rajaji Nagar, Bangalore

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Address: CANE, 809, 17 Main, 5th Block, Rajaji Nagar, Bangalore 560010

LETTER BOX

Chernobyl day was observed in North Canara district as a day of fasting and protest against the installation of the nuclear power plant at Kaiga. In response to the call given by the Uttara Kannada Parisara Samrakshana Samiti, Sri Visweswara Thirtha Swamigalu of the Pejawar Butt, Udipi undertook a fast at the gates of the Kaiga project. 500 satyagrahees sarched from different talukas of the district to the reactor site. The authorities had suspended the plying of the state road transport buses from Karwar to Kaiga for two days fearing that they would be used by the protestors. Despite these difficulties the protestors did enter the Kaiga site. It took nearly three hours for the police to round all of thee up. They were taken to Karwar late in the evening where the police refused to feed thee stating that they Mere free to go where they pleased. The satyagrahees spent the night in the open near the police headquarters in Karwar and the next day they took out a silent procession to the deputy commisioner's office. Here, a delegation net hie and presented hie with a memorandum for the Prime Minister. They then dispersed after deciding on the next step in their caspaign.

H.S.Doreswamy

6andhi Bhavan, Kumara Park East,
Bangalore-1

The Narora Atomic Power Plant went critical on the 12th of March, 1989. The process of attaining criticality was kept a secret till the last moment by the DAE.

This

highhandedness is a demonstration of their utter concept towards human beings.

A visit to Narora revealed the following shocking facts to us:

1. The mandatory 1.6 Us safety fence has not yet been constructed.
2. People are still living within this 1.6 Kes buffer zone and hence are being subjected to radiation without their knowledge or consent.
3. There have been ruaours of workers having been contaminated during test run's.
4. People are being forcibly evicted by the police though tote of thee have not yet received any compensation.
5. The rehabilitation programme is non-existent. Evicted farmers do not have any work after the current harvest. Horse still they are being forced to live in slums near Narora.

A. Public safety measures leave much to be desired. IAEA regulations state that the public residing it the vicinity of plants must be informed about the hazards posed by these plants; fire, medical and other emergency services

tost be geared to handle radiation related eventualities.

None of these requirements have been met at Narora, or any of its surroundings - an area of high population density.

There have been serious allegations regarding use of substandard materials in the construction of the plant. Brave risks are being taken with the lives of millions by reckless technocrats.

We are an informal antinuclear group operating frof Delhi trying to raise awareness on this issue, be strongly urge you to take up this task of exposing this fraud now being touted as a 'great achievement.

Rajeev Singh and Ratna Mathur

NONE(Network to Dust Nuclear Energy)

Flat AD-118-B

Shalimar Bagh, Delhi 110052

It was nice to see Anumukti back in circulation after i long, long time. After the National workshop on Nuclear Energy last December, we have brought out a detailed

pamphlet in Kannada on what happened it the debate. Me also plan to bring out a CANE newsletter sainly about the anti Kaiga activities in Karnataka.

Sanjay Havanur

61 Central Excise Layout,

Vijaynagar, Bangalore -40.

The issue of nuclear power is getting tore and tort important. I think that is part of our achievement. It is true that we are very far from our goal - but if people like you keep on continuing their activities - it will produce results in the future.

Sometimes I feel that sharing of feelings and warmth between activists is more important than here collection and dissemination of information. Ofcourse I don't sean to say that 'decoding' of information is of little or no importance. But meeting people belonging to the same Mavelengh gives a greater impact which helps the activist.

The latest issue of Anumukti was it a way a very good compilation of articles with supportive information. But have you any plans to improve the getup of the journal with pictures and cartoons? It involves money and manpower - I know. But can't we try to collect that resource?

Dr.Smarajit Jana

Ultadanga VIII-M, Housing Society

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Calcutta 700067

I wish to refer to the article 'Disasterous Drill' in the last issue of Anumukti. I believe that even if DAE falls far short of the accepted standards of performance it the drill, it is nevertheless a desirable drill particularly as we have already acquired a hazardous indesirable set up including nuclear plants and several other industries of equally great destructive capacity. Even

people's attention for disaster preparedness so that in the mot of on unfortunate incident taking place, tot danger to lift and property can be ainimised. The exercise also underlines tot great part played by resour in all such disaster situations.

M.K.Jain

Joint Assistance Centre
N-65, South Extension-1
New Delhi 110049

Last year by uncle became the sarpanch of the village panchayat of Rawatbhata (Kota).Me tells me that the Rajasthan Atomic Power Project authorities discricinate against the local popultion. So mach so, that even basic amenities such as water and medical facilities *are* denied to thea. Even after so many years the project has tot generated any significant employment for the local population. Secondly, they have still 00 knowledge of any safety seasures they sight be required to take in case of a catastrophe.

liked the new issue of Anumukti. Do you have a copy of the Ramarao Committee report? Does it contain anything of significance?

Sunil

Bansalkheda (Saheli)
P.O. Kesala via I tarsi
Moshangabad (M.P.) 461111

Editor's Reply: Although Dr.. M.R.Srinivasan had promised to provide this and other reports at the bangalore workshop last year, and had specifically appointed Dr.M.V.Ramaniah for the purpose, a request to Dr.Ramaniah only elicited the response that "one or two document repositories are being planted and one would have to wait till these repositories begin functioning in order to get the reports.*

Rancho Seco: Shut Down by Citizens

The Rancho Seco reactor in California, U.S.A., became the first reactor in the United States to be shot down by the disapproval of voters. In a referendua on June 6th, voters of the Sacramento Municipal Utility district rejected continuation of further operations at the plant, by a vote of 53.42.

Tot Rancho Seco has had a troubled history from its beginning in 1974. Its lifetime capacity is only about 407 and it suffered two 'near misses,' one in 1978 and another in 1985.

The Rancho Seco case takes clear the declining treed In nuclear economics. Although the plant was relatively cheap to build by current standards - it cost only 1375 million - rising operating and maintaianance costs made its electricity uncompetitive.

Sources The Nuclear Monitor June 12, 1989

All APOLOGY -TBT AGAIN!

Anunukti has fallen so far behind schedule that it is a scandal. Mo apology can suffice. The only redemption can be immediate and vigorous efforts to bring Anumukti back on schedule. This we are trying to do. We have numbered this issue Vol.2 No.6 to bring it in line with the date of publication. We hope to despatch Vol.2 No.4 which will mainly focus on energy conservation by the 10th of July and Vol.2 No.5 which will celebrate the bicentenary of the French revolution by highlighting French nuclear imperialism in the Pacific by the end of July. We shall resume regular publication from mid August with Vol.3 No.1.

We wish to thank Shri I. J. Desai for use of his computer which has allowed us to compose this issue. Special thanks are due to Ms Falguni Desai for her help.

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