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*if I fail
to work the horror
into a play
of voices in which the living and the dead
live again*

who will forgive me

. Marc Kaminsky

The Road From Hiroshima

The United States' government often considers itself the world's policeman. And, like the police in most parts, it conducts itself in a manner as if it was above the laws which govern civilized behaviour.

Forty five years ago, US brought nuclear misery upon the world by being the first and so far the only nation which has used an atomic weapon on another. It was an event that shocked everybody. An American poet, Marc Kaminsky, puts it rather well

*Whatever you hear
about Hiroshima
whatever wild stories you hear*

all of it happened.

Last month US again crossed the line. This has been done with so much impunity and with so little outrage and condemnation from the rest of the world that one shudders to think of what life is going to be like in the "new international order" that is to follow this carnage in the Gulf. The bland, almost aseptic statement, "Iraq's nuclear capability has been destroyed" hides an enormous crime. What has been done is the bombing of an operating nuclear reactor and the willful spread of radioactive pollution. Cleaning up this mess, once the war ends, is going to be a difficult task and one which will contaminate many more people. Even Israel - a country whose government has often in the past acted in a high-handed manner - has never committed such an atrocity. The bombing of Iraq's Osirak reactor by Israel in 1981 and later by Iran during the Iran-Iraq war was done at a time when the reactor was not operational and did not contain radioactive poisons.

Iraq is a signatory to the Nuclear Non-Proliferation Treaty (NPT), and its nuclear facilities are thus subject to inspection by the International Atomic Energy Agency (IAEA). The last IAEA inspection of Iraqi facilities was carried out in November 1990 and provided no indication that Iraq was in the process of building nuclear weapons. Thus, the bombing of these facilities besides setting a new and altogether dangerous precedent also

tells the rest of the world that NPT is not worth the paper it is written on, and that powerful countries have no faith in the process of international inspection. The fact that the bombing took place just after the ratification by the Soviet Union and Western countries of the first addition to the Geneva agreement of 1949 prohibiting attack on nuclear installations in wartime, just makes the act doubly shameful

Second World War documents indicate that Hiroshima was not the last event of that war but the first event of the Cold War — its real purpose (contrary to much advertised claims) was not so much the destruction of the Japanese will to pursue war as much as to intimidate the Russians and other allies of US with a demonstration of American military might. Then too, a new post war world order was just emerging and the US wanted to show that it would brook no questioning of its "God" given supremacy. If in the process, Japanese women and children and their children were to be consigned to atomic hell—well, they were only Japs. The brutality showed in the wanton destruction of Iraq displays a similar disregard for the sanctity of human life.

Saying all this in no way constitutes approval for the actions of Saddam Hussain. He too has been an international thug! His use of chemical weapons against Iran and even worse against his own Kurdish minority was a gross violation of the norms of civilized behaviour. There can be no doubt that he needed to be effectively curbed; but it is not for those who armed him and were responsible in allowing him to become a monster to now crush him through recourse to even more heinous actions directed against the people of Iraq.

What are the implications to us of a world where nuclear reactors are considered "fair-game" during wartime. We have a large number of nuclear facilities located all over the country each of which is now a greater threat to the surrounding environment and the populace. Unlike the Iraqi reactors which were small in size, our power reactors are huge by comparison and contain much larger amounts of radioactive poisons. Nucleocrat would contend that they are protected by "double containments" — thick steel lined concrete walls which can presumably withstand earthquakes and enemy attacks. However, as the Israeli demolition of Iraq's Osirak reactor in 1981 showed, this assurance is as worthless as other nucleo-assertions. Even if one were to grant it to be true, no concrete walls protect the spent fuel storage pools adjacent to the reactors and if a bomb were to land in one of those, it would be a major catastrophe. In this connection special mention must be made of the hazards posed by the research reactors at Bombay. Though they are smaller in size, they none-the-less contain significant radioactive toxins and are moreover located in an extremely densely populated area. Thus any dispersal of radioactivity would immediately affect a large number of people. The only comforting thought in all this is the ratification by India and Pakistan of an agreement to not attack each others nuclear facilities. But then, in today's world, agreements are made on paper and not in the minds of the people.

Today, we are again on the verge of a new world order. The Cold War has ended. "Evil Empire" is breaking into pieces. But are the Americans - the self proclaimed good guys, not empire builders? Is their proposed new order something that any self respecting individual or nation can subscribe to? It behoves the mighty to act with justice and compassion. The present leadership in America has shown that it is untouched by either. Truly all the wild stories you may hear of Hiroshima, happened. They are happening still.

Surendra Gadekar

An Everyday Affair

Forty spent nuclear fuel elements have arrived for reprocessing at the Dounrey reprocessing facility in Scotland. The fuel rods were transported from a research reactor in India by a normal cargo ship and passed through the Gulf area. Dounrey authorities claimed that they had done so before the Gulf war began.

The fuel was supplied to India during the 1960s, and has now been returned at the end of the contract period. Dounrey is not releasing all the details of the transport but the authorities there have confirmed that it was carried in a normal cargo ship and not in a ship purpose-built for handling dangerous highly radioactive cargo.

'I find it hard to believe that they could have been so irresponsible. Why could they not have waited a few months? After all the fuel has been in India for nearly 30 years. And why could they not have completely avoided the Gulf and instructed the ship to go around Africa?' said Chris Bunyan of the Northern European Nuclear Information Group. He added that it was irresponsible to transport such dangerous cargo - of nuclear weapons grade material - anywhere near the Gulf even before the war started, but to have transported it using an ordinary cargo ship just adds to that irresponsibility.

Source: WISE News Communique No 346

UNALLAYED FEARS

The greatest dilemma which the nuclear establishment in the country has encountered has been: whether to abandon a crippled nuclear reactor or to salvage it by yet to be proven technology exposing workers to high doses of radiation. That, in short, is the story of the Rajasthan Atomic Power Project's first unit (RAPP-1).

It is three years since the Nuclear Power Corporation (NPC) submitted its report to the Department of Atomic Energy (DAE), outlining the extent of damage to, and recommending the replacement of an endshield of the RAPP 1. The endshields at each end of the reactor vessel serve as protection against radiation and high temperature, besides providing support to the coolant tubes. The cylinder shaped reactor vessel houses 306 calandria tubes. In every calandria tube is lodged a coolant tube, each of which comprises 12 uranium bundles. Heavy water flowing through these tubes carries the heat generated in the reactor to the boilers.

DAE Apathy

At RAPP-1, a paucity of funds, coupled with a lack of advanced technology and the general apathy of the DAE have led to undue delays in undertaking the rehabilitation of the crippled unit. Though aware of the dire consequences of such delay, the country's nuclear power authorities seem to have done little about it. A bigger crack in the end shield may result in the leakage of light water leading to a loss of coolant phenomenon and a consequent catastrophe.

There are two kinds of costs involved in running a crippled unit. One is the increased risk of a disaster. This cost one has to pay if and only if a disaster strikes. But if there is a major accident, the cost as shown by Chernobyl would be crippling. But there is also another cost involved - one which moreover, one has to pay in any case. This is the increased radioactive burden on the surroundings. The more radioactive the structure, the higher it is going to cost to decommission it and store the wastes, both in terms of money as well as in terms of the radioactive burden on the workers. Thus many utilities abroad find it cheaper to shut down old reactors rather than to continue running them at reduced output and to pay astronomical decommissioning costs later.

The precursor of NPC, the Nuclear Power Board, had submitted a preliminary report on the damaged unit in 1986. In early 1988, NPC made a detailed report supporting the proposal for replacement of the south endshield. The estimated cost of removing

the damaged endshield and installing a new one was pegged at Rs. 50 crore. Having received the report,, DAE forwarded the same to Atomic Energy Regulatory Board (AERB) to oversee safety requirements for undertaking the task. The DAE, however is yet to sanction the amount.

The cracks on the south endshield were first noticed as early as September 20, 1981. They were discovered by the scientists when the reactor was brought from Canada in parts and assembled here. The defective portion had then been repaired by welding, but 'stress relieving' could not be carried out due to the absence of the necessary facilities at the site then.

Damaged Reactor

During reactor operations, cracks appeared around the affected area due to the effect of high neutron radiation. The cracks have resulted in a leakage of light water which the NPB report considered a serious incident, likely to result in possible defects. Mechanical means having been used to plug cracks, there are apprehensions that the workmen involved in the operation may have been exposed to high levels of radiation.

Preoccupied as it is with the generation of power, the DAE has been unable to allay the fear of exposure. It took four and half years to plug the cracks and the unit started producing electricity after receiving a clearance from the safety committee which approved of the repairs.

RAPP-1 has in effect been used as a prototype by nuclear technologists. First, they were in such a great hurry for bringing the benefits of nuclear power to India that they went in for a full fledged plant without acquiring any experience with a small sized prototype. Then, when its performance turned out to be a total flop, all they did was to perform a semantic trick — they decided to call it a prototype. The problems encountered were not only with the conventional parts of the system like the turbine as mentioned in the article but with everything imaginable — large leakages of heavy water and an inability to make heavy water within the country; (this led to adoption of unconventional and hazardous operating procedures); unavailability of spare parts, troubles with the grid; labour problems; troubles with the emergency core cooling system; cracks in the endshield; what have you- the list is endless

The reactor tripped again on May 20, 1985. Cause: the cracks which had been repaired had

widened. The safety committee put its foot down and advised a permanent shut down of the unit which it believed could not be repaired. But the DAE prevailed over the safety committee and by developing an advanced technique of chemical plugging, succeeded in plugging the cracks.

The repaired unit was once again synchronized with the grid on February 29, 1988. The repairs cost Rs. 1.2 crores. However, the cracks and consequent repairs had taken their toll - from an installed capacity of 220 MW, the unit is currently being run at 90 MW.

Ever since it was commissioned, RAPP-1 has been a problem unit. Plagued by frequent tripping, its overall performance has been rather poor because of grid problems, and difficulties arising from the use of conventional equipment like the turbine.

The frequent tripping of the reactor is traced to a fundamental error that was apparently made during the planning and design of the reactor. In the absence of data with regard to the water temperature from the Rana Pratap Sagar Lake, on whose banks RAPP is situated, the Canadian contractor's designed the plant according to the lake temperatures prevailing in their country. The temperature of the lake was taken to be 21 degrees centigrade, though later it emerged that the lake's temperature was around 31 C. Thus the units will never be able to achieve the 220 MW capacity and can at best generate only 198 MW of electricity, the DAE's claims of having achieved the installed capacity generation notwithstanding.

This excuse is really the limit. Pray, how difficult it is to obtain data regarding a lake's temperature? The Canadians obviously designed reactors to suit their own conditions. When we decided to import their technology, they were obviously not going to redesign the plant just to suit us. It was our need and the onus was on us to do the redesigning. We preferred to borrow their design wholesale without a thought regarding our conditions. We deserved what we got - a substandard machine and plenty of headaches.

Moreover, the reactor has tripped 300 times till date, weakening the system which has not been insulated against such thermal shocks. It takes 36 hours to restart the nuclear power station after tripping.

If the NPC's technical report is accepted along with AERB rider for safety requirements, unit -1 will have to be shut down for at least four years to facilitate the removal and subsequent erection of a stainless steel endshield.

Post-facto Prototype

Experts feel that the removal of the endshield is technically feasible. But the question engaging the minds of engineers whether such an exercise will be

possible given the limited space within the reactor building, and the proximity of the endshield to the reactor vessel which has a radiation level of 100 Roentgens per hour.

Though the Bhabha Atomic Research Centre has the expertise for remote controlled handling of equipment exposed to radiation, it has not been put to industrial use yet. An expert states that "the present technology is limited to the changing of fuel bundles alone, and no one has yet conceived the possibility of changing the endshields nor initiated work in this regard."

DAE asserts that the job has to be necessarily undertaken in view of the similar designs of three other plants: RAPP-2 and both units of Madras Atomic Power Station (MAPS). "Rather than write off the crippled unit, it is economical to go in for repairs as it would provide us the technical competence and expertise to handle such jobs in the future," observes a NPC official.

Officials of the AERB, however, feel that in the event of an emergency, the shut down will be hurried and safety precautions will not be taken. Nuclear Power Corporation oblivious of future catastrophe, is keeping the unit running, for fear that a power shortage in the state may evoke adverse public reactions. "NPC is likely to continue underestimating the problem until more cracks appear," an AERB official remarked.

The sad part of this prototype saga is the fact that it is the poor innocent children of the surrounding villages who have had to pay the real costs of training nuclear technologists in the form of illnesses and tumours. (See "Chernobhata" In Anumukti Vol.4 No.1)

NPC managing director S.L.Katti has admitted that the DAE will be approached for funds to undertake the repairs. A major portion of NPC's activities is funded by the DAE. In 1988-89 it received over 80 per cent of Rs 1459.15 crore from DAE.

Unsolved Mess

Katti stated that the job of removing the endshield could be undertaken only when the coolant channels are removed the next time which will be four to five years from now. He was emphatic that there were no immediate plans to take up the job also because proper remote tooling to handle such an operation was yet to be developed. "BARC has developed and tested remote tooling to handle other hazardous operations which could be helpful in developing specialized tooling needed for our job," he said.

Admitting that it was uneconomical to continue to run RAPP-1 at 85 MW, Katti indicated that the Rajasthan State Electricity Board is likely to be approached soon with a proposal for a hike in power rates. "If they do not approve of the hike, they may

have to do without power from our plant," he said.

Rather than admit the non-availability of funds and technology to undertake the changing of the endshield, the DAE consistently makes statements to the effect that "repair works of the kind never undertaken anywhere in the world are in progress."

Successive DAE secretary's from Dr Raja Ramana to Dr M R Srinivasan in order to wiggle out of the mess have time and again stated that RAPP -1 was an imported reactor which was still to be commissioned by the exporting country itself. It may be pertinent to point out that the Douglas Point reactor

in Canada (on whose design RAPP was based) developed similar problems and was prematurely shut down.

If RAPP-1 was a prototype whose performance had not been assessed, why did the DAE rush ahead with commissioning other similar reactors in the country such as RAPP-2 and both units of MAPS, without first evaluating its performance? The nuclear lobby is unwilling to answer this.

*SOURCE: Kumar Basu in The Independent
February 20, 1991.*

Keep Taking the Tablets in Case of Mishap

Amid rising fears about the safety of one of Central Europe's biggest atomic power plants, pharmacies in Austria and Czechoslovakia are to distribute potassium iodide tablets to help protect their populations in event of a nuclear accident.

The Austrian health ministry said the tablets, a precaution against radiation-induced thyroid cancer, would be made available free of charge in the next few days to children, pregnant women and nursing mothers. Czechoslovakia has already begun providing the pills within a 20 mile radius of the nuclear power station at Jaslovské Bohunice in Southern Slovakia. The thyroid absorbs iodine from the tablets and becomes saturated thus preventing further absorption of radioactive iodine from any accidental release.

An Austrian government commission concluded last month that unsafe conditions at the plant, 35 miles across the republic's northern border, threatened a new Chernobyl-like disaster. Austria's socialist chancellor, Franz Vranitzky, responded to the report by demanding that Prague shut down the plant, which uses Soviet made pressurised water reactors of the WER-440 type. (Quite similar in design to the one's now planned at Koodankulam in Tamilnadu — Editor). He offered provisional deliveries of free electricity to Czechoslovakia to make up for the power lost by a shutdown, and has called for a Central European zone free of nuclear power stations.

A fire at Bohunice on 15 January and another six days later at Czechoslovakia's second nuclear power station at Dukovany has increased Austrian fears about its neighbour's reliance on atomic energy. No one was injured in the fires and the Czech authorities say that there was no release of radioactivity

Austrian economics minister Wolfgang Schüssel said that the compensatory supply of power to Czechoslovakia would cost \$330 million per year. Austrian power plants were capable of filling in for Bohunice "with some effort," Schüssel added.

While a 1978 public referendum banned the use of nuclear power stations in Austria, Czechoslovakia depends on them for a quarter of its electricity. International pressure to cut this comes at a time of rising economic difficulties in the transition to a market economy.

The Czechoslovak government acknowledged last year that the Bohunice plant did not meet international safety standards. However, it says that it has been advised by the West German company, Siemens and Westinghouse of the US that the plant can be modernized and remain in operation.

Austria's offer to supply alternative electricity has so far met with scepticism among officials in Prague.

Michael Wise in The Independent - London

SKYROCKETING NUCLEAR COSTS

Since 1980, the construction cost for nuclear plants in the US has increased four-fold, while operating and maintenance costs for existing plants increased more than 10% annually, despite extensive government support. Proposed new nuclear power plant designs have serious safety shortcomings and would be among the most expensive options for producing electricity.

-WISE NEWS COMMUNIQUE 344

Chernobyl Reactor's Next of Kin

B Below we reproduce a letter written by nine environmental organisations in Canada to

The Canadian Prime Minister urging him to reject a loan application from Romania to complete construction of five nuclear power reactors at Cernavoda. We are doing this because firstly we strongly endorse the sentiments expressed in the letter and secondly also because India too has gone in a big way for CANDU type reactors and many of the observations contained in the letter are of relevance to us.

We are writing to oppose the proposed extension of the loan for building Candu reactors at Cernavoda, Romania. We call upon all members of the House of Commons to refuse further funding for the project.

Nuclear power is dangerous, expensive and unnecessary wherever it is proposed or tried. Romania is no exception, and the lack of democratic mechanisms in the country make nuclear power an especially risky venture.

Nuclear power is dangerous, and may be more so in Romania. One concern is the nuclear weapons connection. Ceausescu boasted that with the Candu, he also had atomic bomb capability, and the regime that replaced him may have similar intention. Every Candu customer thus far—India, Pakistan, Argentina, Korea — either has the bomb or is reported to be working towards it.

Another threat is the possibility of a major accident such as the one at Chernobyl. The ingredients that caused the accident at Chernobyl — design flaws, operator errors and situational circumstances — all have parallels at Cernavoda.

- The Candu shares a design flaw with the Chernobyl reactor - a flaw that was a major contributor to the accident. The flaw, known to nuclear engineers as a positive void coefficient, causes the reactor to accelerate in the event of cooling failures. Massachusetts Institute of Technology's *Technology Review* magazine (July 1989:50) described the CANDU as the "closest operating relative" to the Chernobyl reactor on the basis of this shared design fault.
- Labour problems at the Cernavoda plant may already have jeopardized safety. A CANDU reactor operating in Romania will have to contend with a relatively unskilled labour force in both its construction standards, and with what appears to be conscripts still working at the site against their will, the possibilities for accidents by neglect or sabotage are enormous. Recently released documents indicate that Atomic Energy of Canada Ltd was forewarned of the problem with forced

labour and poor construction work, but proceeded with construction and was unable or unwilling to prevent the problems from occurring.

- The technological infrastructure and services (evacuation plans and medical expertise, for example) are not likely to be better in Romania than they were in Ukraine. We have no reason to believe that the Romanian government will be more accountable to its people than was the Soviet government: it took days for Moscow to admit that there had been an accident at Chernobyl, and even four years after the accident, local populations are still being moved from the accident area — people were unnecessarily exposed and this could happen again at Cernavoda.

At a time when powers were being devolved from the central dictatorship in the Soviet Union to local and state governments, the people living near the Chernobyl reactors were finally able to do what they have wanted to do for years - shut them down. The Ukrainian legislature has moved to close the last of the Chernobyl reactors by the end of this year. Had this movement towards democracy been made five years ago, the world might have been spared the legacy of radioactive pollution that Chernobyl wrought.

People all over the world, when given a chance, usually say "no" to nuclear power. Referendums in Italy, Switzerland, Sweden, Austria and California have led to moratoriums on nuclear power development and, in most cases, the premature closure of operative reactors. Upon supplanting totalitarian regimes, democratic governments in Poland and Philippines ended their country's nuclear power programmes. Since the advent of Perestroika in the East Block, people have used their new found access to information and freedom of protest to launch a passionate and effective antinuclear movement: over 55 nuclear facilities have been closed or canceled in the East Block since the accident at Chernobyl.

Romanians do not have the opportunity to say "no". The Romanian people have neither been in-

volved in the decision to develop nuclear power nor duly informed of its risks. There is much evidence to suggest that the Romanian government is still abusing human rights and is unaccountable to its people. Canada should not be a party to the Romanian government's efforts to foist such a dangerous and unnecessary technology upon the people of that country.

That Romania is experiencing a severe shortage of power is undeniable: new supplies of electricity must be found and existing supplies must be more efficiently used and more fairly allocated. However, environment and society are sure to suffer if decisions regarding the provision of power are made without public participation. Intelligent decisions

regarding development and the environment cannot be made in isolation from the crucial checks and balances that come with public scrutiny.

Romania should be able to meet its need for electricity with a mix of efficiency improvements, co-generation and other small renewable energy technologies: therefore nuclear power is unnecessary. We, therefore call upon the government to cancel further consideration of this loan.

Contact Address and letters of support to:

*Norman Rubin, Energy Probe
225 Brunswick Avenue Toronto
Canada M5G 1L5*

The Glare of Public Scrutiny

Nucleocrats all over the world lie so often that it should come as no surprise that they sometimes get caught. We have often in the past referred to the fact that the stated nuclear costs bear no relationship to reality. Thus the statement, often made for the sake of comparison with coal fired plants, that reactor A has been producing electricity at x paise per unit, properly belongs to a work of fiction. The following article is significant for two reasons. Firstly, it is the report of an official committee and secondly because it appeared in **ATOM**: the journal of the United Kingdom Atomic Energy Authority. It was, characteristically hidden on page 29 of the October 1990 issue under the heading:

House of Commons

Energy Committee Report: The cost of nuclear power

The Energy Select Committee under the chairmanship of Dr Michael Clark has published its fourth report, "The costs of nuclear power" The committee states that:

"The purpose of our enquiry was not only to examine the reasons for the perceived increase in the cost of nuclear power, but to discover why, despite this Committee's warning, the government did not recognize more quickly the level of costs, and why it embarked on a policy of privatising nuclear power which the high cost and substantial risks of nuclear power eventually forced it to abandon."

"Nuclear power has long been presented by the government and electricity utilities as cheaper or potentially cheaper, than other forms of generation. The Central Electricity Generating Board (CEGB) in 1988 informed the Hinkley Point C public inquiry that the "economic resource cost" of the proposed Pressurised Water Reactor would be 2.24 pence/kWh, less than for coal fired generation (at 2.50 to 2.62 p/kWh, depending on whether the station was coastal or inland). Yet subsequent nuclear costing have been considerably higher than those for fossil-fired generation. National Power later put the lifetime "private sector price" of PWR generation

(calculated on a different basis) at 6.25 p/kWh whereas it suggests that the same for fossil-fuel fired plant would be between 2 to 3 p/kWh.

The Committee summarized its main conclusions as follows:

- Different rates of return in the public and private sectors for investments involving similar risk are an invitation to misallocate resources by spending money on relatively high risk, low return public projects, and the CEGB and the Department took too little account of the risks borne in the public sector.
- *We reject the belief of CEGB and the Department that different assumptions as to availability and other uncertainties should be made according to whether a project is in the public or private sector.*
- *We reject the view of CEGB and the Department that the cost of electricity from a reactor could be almost doubled by privatisation, and we are profoundly concerned that the CEGB should have put a low figure to a public inquiry in support of the case for a major public invest-*

ment *and one almost twice as high shortly afterwards* for power from the same reactor in the private sector.

- The transfer of risks from utilities to the consumer or the government *has constituted an unacknowledged and major subsidy over the years to nuclear power.*
- We are convinced that there has been *a systematic bias* in CEGB costing *in favour of nuclear power*, both in ignoring the risk and failing to provide adequately for contingencies, and, in respect of investment, in putting forward 'best expectations' rather than more cautious estimates.

The Committee recommended :

- The Department of Energy and the regulator should publish comprehensive information on how the fossil fuel levy (which subsidizes at present the nuclear electricity generation in UK) is set and the reasons for any changes.
- As a matter of urgency, the Department of Energy should estimate as accurately as possible the costs of completing and operating

Sizewell B during its intended life compared with the costs of canceling it and generating the same power from other sources; and in so far as continuation is justified by non-economic benefits, comparison should be made with the cost of alternative ways of achieving those benefits. The Department should publish the estimate, explaining how it was calculated.

Any costs involved in extending the lives of magnox reactors should be fully and publicly accounted for, using a rate of return on avoidable costs comparable to that of other forms of electricity generation and removing any distortion caused by the fixed element in British Nuclear Fuels Ltd's charges.

- *It is essential that if further nuclear investment is justified in 1994 on grounds of diversity of supply or reduced pollution, the economics of nuclear power are in no way glossed over, that the full costs and risks of nuclear power are ascertained as closely as possible, and that the analysis is fully exposed.*

From Hiroshima to Rokkasho

In Gujarati, Rokkasho means asking for a halt. For a while it looked as if this tiny village in Aomori prefecture on the northern tip of the main Japanese island would really live up to its Gujarati meaning, and bring to a halt the Japanese nuclear expansion programme. Unfortunately, the victory of the pro-nuclear Masaya Kitamura, in the election to the governorship of Aomori prefecture, due to the division of the antinuclear vote amongst two candidates who together polled some 100,000 votes more than him, has given a new lease of life to one of the biggest programmed assaults on the environment anywhere in the world.

Engine of Nuclear Industry

Japan is one of the leading industrialized nations. However, it is very poor in energy sources and has to import most of its energy in the form of oil, coal, and uranium. Thus the appeal of an indigenous energy source, independent of the vagaries of world politics, is very strong to the bureaucrats and industrialists who run Japan. They view the growing pile of nuclear waste from reactors, as their very own plutonium mine. Presently 30 percent of Japan's electricity comes from nuclear sources. The plan is to raise this to 40 per cent within the next two decades, based primarily on plutonium.

This continuing drive towards nuclear is what makes Japan unique amongst OECD countries. In all other rich, industrialized nations nuclear programmes are being wound down. There have been very few new orders for nuclear power stations within these countries. Nuclear industry for survival depends on suckers in the Third World. However, leaders of these nations though eager to traverse the nuclear path don't have the wherewithal to match their sky-high ambitions. Thus, Japan has during the last decade, become the engine of the world nuclear power industry with its demand sustaining technologies in -US and Europe. "There are many lessons to be learnt from Japan by the rest of the world on how to construct and operate nuclear power plants" says Kent Hansen, who chaired a recent US government study on Japan's nuclear policies.

However, the pro-nuclear consensus that made it all possible began to erode following the Chernobyl disaster of 1986. Matters got worse in January 1989 when a damaged pump forced the Tokyo Electric Power Corporation to close down a reactor for nearly two years. A government survey carried out in September last year showed that while two thirds of the Japanese public thought nuclear power was necessary, over 90 per cent had anxieties. A major cause for the anxieties besides the fear of accidents is the fact that Japan has as yet no place to store both the

high level as well as low level radioactive waste

Biggest Nuclear Complex

The centre-piece of the Japanese nuclearization policy is the sprawling, (\$9.09 billion) nuclear fuel complex to be built at Rokkasho. When completed, the facility, which consists of an uranium enrichment plant, a large reprocessing plant to recover plutonium from spent fuel and a radioactive waste storage center, would be one of the biggest nuclear centres in the world. It should come as no surprise to those conversant with 'development' to know that Rokkasho and indeed the whole of Aomori prefecture is the poorest of Japan's 47 prefectures with the sole exception of Okinawa. The weather is harsh and the infrastructure is patchy. It is also home to other such 'development' projects which the Japanese government considers necessary but undesirable. It is unsuitable as a nuclear site since it is a region of geological instability with high ground water level. A still more ominous feature of the site is that all the facilities will lie under the "specially controlled sky area" of the US and Japanese air-forces since Rokkasho is situated very near to both Misawa air base and Amagatori air-to-ground gunnery and bombing range. There have been ten aircraft related accidents there in the last five years including F16 fighter bomber crashes and erroneous dropping of dummy bombs in the surrounding area.

Worried Proliferation Experts

It is not only the local farmers and fishermen who are worried by the Rokkasho complex. Nuclear proliferation experts in the US and Europe are equally worried. The facility, "does not make economic sense and the plutonium glut it creates could be inflammatory at home and abroad," concluded a recent study by the Science Policy Research Unit at the University of Sussex in Britain.

Presently, Japan exports almost all its nuclear waste to France and Britain, which have large reprocessing plants of their own. These countries are supposed to extract the plutonium and then ship it back to Japan along with other radioactive garbage produced by the reprocessing Process starting from next year. However, the logistics of this massive radioactive transport is getting complicated. Originally, the plan was to airlift the stuff over the north-pole. That plan has now been discarded since Japan was unable to prove sufficient crash protection. Now, the idea is to start regular shipments of as much as 30 tonnes of plutonium over the next decade. Since that is worth thousands of bomb-worth of plutonium protecting these ships from terrorist attacks is going to be a serious problem. Besides, there is an urgent need to store the junk somewhere. Hence the attraction of Rokkasho to Japanese policy makers.

High Level Dump

The Low-Level Radwaste Storage Center where these and other radioactive wastes are to be kept is a misnomer. What it actually denotes is a high level permanent dump. The Atomic Energy Commission of Japan defines low level waste as one that contains no more than 2.5 Curies of radioactivity per ton, whereas at the storage center more than 100 Curies per ton would be permitted. The reason for this high level is that the materials stored in the drums, like used ion-exchange resins, contaminated gloves and clothing are presently incinerated to reduce the total volume of the waste, resulting in a much elevated concentration of radioactivity. Consequently, the radiation level at the surface of a single drum would amount to 1 Roentgen per hour. The plan calls for burying 200,000 of these drums in the initial stage, which would last for a period of ten to fifteen years. During this time, the pit would be open to facilitate burial. Therefore, even under 'normal' conditions, with no accidents local residents would be exposed to this high level of radioactivity.

Plutonium Surplus

The Japanese government and industry have repeatedly asserted that the shipments of plutonium from Europe are necessary if a shortfall in supply of plutonium to research reactors is to be avoided in the early 1990s. However, several studies indicate that this is just not true. A study carried out by J. Takagi and published in the *Bulletin of Atomic Scientists* shows that Japan's stockpile of surplus plutonium will amount to as much as 50 tons by the beginning of the next century — an amount sufficient to produce thousands of atomic bombs. This is a chilling prospect for anyone concerned with nuclear arms proliferation.

The government strategy to cope with this surplus plutonium is to burn it in conventional reactors as MOX (Mixed Oxide Fuel of uranium and plutonium). However, the long term future of this strategy is still in doubt since ever increasing costs of reprocessing coupled with the continued low costs of uranium make this option uneconomical.

Thus, even inside the world nuclear industry, scepticism is growing regarding the rationale for plutonium recycling. Japanese government seems to be quite alone in its willingness to promote the plutonium business. The future of world plutonium Industry now hinges upon the attitude of Japanese nuclear industry.

It is a long way from the suffering of Hiroshima and Nagasaki to being the nuclear engine of the world. The fact that it has been traversed shows that hunger for power is a madness that does not respect geographical boundaries or historical experience.

Nuke Info Tokyo No 20 & 21.

'No' to Jellyfish Babies

Historically, most attention to nuclear issues has focused on the concerns of the rich states of the northern hemisphere, while some of the greatest instances of nuclear pollution have been in the islands of the Pacific.

- Since the Second World War, 238 nuclear bombs have been blasted in the Pacific islands. 14 of the Marshall Islands were made uninhabitable by U.S. testing.
- Between 1946 and 1970, the U.S. dumped 100,000 curies of radioactive waste in Pacific Ocean sites.
- In 1979, Japan announced its intention to dump 10,000 drums filled with low-level radioactive waste at a site north of Marianas Island on an 'experimental' basis.
- In 1980 U.S. and Japan launched a joint feasibility study for the storage of spent nuclear fuel from Japan, Taiwan and South Korea in the U.S. Trust Territories in the Pacific. The results have not been announced so far.
- Ruptured waste containers and radioactivity above normal levels has been detected off the coast of French Polynesia following weapons testing. The French blithely continue to test.
- In 1982, the U.S. Navy announced that it intended to sink at least 100 obsolete nuclear submarines in the Pacific during the next three decades.

Throughout Micronesia, there have been virtual epidemics of cancer and thyroid tumours, with women and children the principal victims. A macabre and increasing problem in the Pacific is what has come to be known as "jelly-fish babies" — babies born with no separately formed heads or limbs who die a few hours after birth.

Realizing the danger to their children and their progeny, women in the Pacific have decided that they will not allow this "sword" to hang over their heads anymore. They have joined forces to oppose the militarisation and the pollution of their land and water. They are asking women around the world to join them in providing a support and form an information network. As a step in this direction, Women for Mutual Security (WMS) - a coalition committed to world peace and common security sponsored the International Pacific Policy Congress from January 7th to January 12th, 1991 in Port Vila, Vanuatu.

The conference brought together women activists from the Pacific, New Zealand, Australia, Africa and

North and South America. The participants decided to take the initiative in informing women's movement activists around the world of the status and the effects on women and their families of nuclear and missile tests, military stockpiles and the dumping of hazardous chemical and nuclear wastes in and around the Pacific Islands. They also decided to work closely together and with other groups working in the Pacific on different issues such as environmental hazards, problems of indigenous people, the women's movement peace and development issues.

WANE Declaration of Support

The word radiation is not new for us in Kerala. The coastal sands of Alapad, Ponmana, Chavara, Neendakara in the Kollam district contain large amounts of radioactive thorium. The people living in these areas have been subjected to some of the highest natural background radiation in the world for centuries. We see the ill effects of this radiation on them in the form of higher incidence of all sorts of diseases and a large number of Down's syndrome children. (For a detailed description please see the January 1991 issue of *Safe Energy and Environment* -Editor)

Though the birth of a physically and mentally handicapped baby is a problem for the parents, family and the society at large, the whole responsibility of the child is entirely on the mother, in the present social set up. Pregnant women and developing infants are most vulnerable to radiation. We see the devastation of the earth by the corporate warriors and the threat of nuclear annihilation by the military warriors as feminist concerns.

We don't want to live on a dying planet, drinking its poisoned waters, eating its irradiated food and breathing its contaminated air. We envisage our life as being in harmony with the life of the planet as a whole.

We strongly protest and raise our voice against the injustices being perpetrated on our sisters in the Pacific. We urge individuals and groups everywhere to join hands with us in extending support to Women for Mutual Security in their activities and struggles. *Please send your letter of support to:*

*Women for Mutual Security,
1. Romilla St. 146, 71
Kastri, Athens, GREECE*

Ms. Nandini

*Women Against Nuclear Energy,
X/526, Koyickal House, Kottayam-2, Kerala*

Business Before Bombs

Hindsight, it is said, is always twenty twenty. Perhaps. But are the lessons learnt from the bitter experiences of the past any use in moderating future excesses? Not, it would seem, when there are profits to be made.

"Misleading labels for technological projects can conceal important policy issues. "Project Plowshare" was the name given in 1950s to the plan of using nuclear explosions for peaceful purposes — the labelling was plainly misleading. It made it easier for Indians to pretend that their nuclear explosion served only peaceful purposes. People think of swords that have been forged into plowshares as harmless because they cannot be used for war: but so-called "peaceful" nuclear explosions can destroy a city. Indeed, a basic weakness of some of the past policies has been the assumption that an application of nuclear energy will not be of military use simply because it has some civilian use."

The above is a quote from Fred Charles Ikle, who served under Presidents Nixon and Ford as Director of U.S. Arms Control and Disarmament Agency. The article from which this quote has been taken appeared in *Bulletin of Atomic Scientists* of January, 1980. It is based on his foreword to the book, *Swords from Plowshares*, edited by Dr. Albert Wohlstetter and published by the University of Chicago Press in 1979. The research on which the book is based, according to Ikle, "revolutionized thinking in the United States and in other countries as well, leading the way to radical new departure in U.S. non-proliferation policy."

Unthinkable to Forego Nuclear Power

Tracing the history of non-proliferation efforts Ikle goes on: "That it is undesirable for atomic weapons to spread is an idea as old as the nuclear age. And it was recognized from the very outset that the peaceful applications of nuclear technology would therefore have to be restricted. This was the outlook in 1945. It was natural and easy for President Truman and the Canadian and British Prime Ministers to agree that there should be no disclosure of information, "even about the industrial applications" of atomic energy, until an international system of control was set up. Some twenty years later these priorities had become completely reversed. In 1968, U.S.A.'s ambassador Arthur Goldberg told the United Nations that it would be an "unacceptable choice" indeed "unthinkable" to decide that non-nuclear countries "must do without this extremely promising energy source—nuclear power—simply

because we lack an agreed means to safeguard that power for peace."

No Dividing Line

The "principal culprit" for this turnaround was the "Atoms for Peace" programme, according to Ikle. Particularly harmful has been the lack of understanding of the physical realities that would govern diversions of ostensibly peaceful nuclear activities to a weapons programme. Far too much assurance was drawn from the fact information on design of weapons would continue to be kept secret and far too little stress was placed on the dangers of spreading technology and materials for the bombs themselves. This misunderstanding was compounded by the persistence within the U.S. government of a specific piece of misinformation: the claim that plutonium from power reactors was normally not suitable for making bombs. It is not quite clear why so many technically competent people helped to propagate this erroneous notion. It is clear, unhappily, that some used it deliberately to deceive their superiors as to the dangers of plutonium recycling....It was strange — indeed irresponsible — that the engineers and scientists who developed the reactor technology during the 1950s and 1960s so badly neglected the technical factors that could help divide the peaceful from the destructive use of the atom. Little effort was made to analyse this dividing line, let alone to strengthen it. Indeed in some instances, the dividing line was mindlessly weakened. For example, to reprocess spent reactor fuel, the designers chose the Purex method, which had been designed to produce especially pure plutonium -for what purpose? For making bombs. This Purex method was subsequently assiduously distributed by the U.S. Atomic Energy Commission throughout the world. Over 11,000 technical papers were declassified in the proliferation avalanche released by the Atoms for Peace programme."

Thriving Arms Business

I have quoted rather extensively from this article just because it is not some run of the mill academic who has written it but a senior official in the U.S. administration, who moreover states that, "The research reported in *Swords from Plowshares*, made a most critical contribution towards a more effective policy against proliferation." One would naturally assume from all this that the lessons from the mistakes made in the Atoms for Peace programme had been learnt and were now not likely to be repeated. And one would, naturally, be wrong. After all busi-

ness is business and there is no business like the arms business. Ask Adnan Khashoggi and Chandraswami if you don't believe me!

The following is mainly taken from a news-report which appeared in the *Asian Wall Street Journal* of December 10, 1990.

In a crowded hotel room at Oak Ridge in east Tennessee, just outside a federal bomb factory known as Y-12, weapons managers who have spent their lives sworn to secrecy unveil their newest project. By Christmas, they plan to declassify -after 45 years -the membranes used to enrich uranium for hydrogen bombs and license the technology to U.S.companies. The membranes could be used to clean smokestack gases, purify water and filter beer, says James Palmer, the project manager.

These are times of momentous change at the U.S.Energy Department's \$9 billion empire of research labs, nuclear reactors, weapons factories and a desert test site dedicated to building nuclear weapons. As the Soviet military threat wanes, scientists and engineers who produced generation after generation of doomsday weapons are offering to help arm U.S.companies technologically against Japanese and German competitors.

No More Sugar Daddy

In showing off technology to makers of cars and computer chips and trying to eliminate whole categories of classification, Energy Department officials hope to do more than simply make U.S. in-

The Eveready Connection

"The environment around Oak Ridge received tremendous abuse from the beginning. Despite the fact that people across the country were developing a greater appreciation and understanding of the environment during the sixties and the seventies, and passing legislation to enforce protection standards, environmental protection at Oak Ridge remained archaic at best."

"When Washington pursued the development of the hydrogen bomb in the early 1950's, Y-12 was chosen as the site for the chemical separation of lithium-6 from the more abundant lithium-7. This lithium isotope separation process required a large amount of mercury. It has been stated that over half of all the mined mercury in the world was at one time in Oak Ridge. The handling of this toxic substance was lax at best. Workers claim that they would at times wade in mercury following spills or leaks. Major mercury spills took place. Three spills of over 100,000 pounds have been revealed with numerous spills over 20,000 pounds. Over two million pounds of mercury remain lost to the environment."

"The Tennessee Department of Health and Environment was aware of some of the environmental problems but was unsure of its enforcement role with respect to a federal government facility. More importantly, operators at Oak Ridge had effectively used "national security" as an intimidating shield which thwarted serious investigation of the facility."

"A 1984 newspaper report disclosed that the Y-12 Plant had lost over 1,700 pounds of weapons grade uranium-235 between 1947 and 1982. This amount would allow for the production of eighty-five atomic bombs. Department of Energy has never publicly accounted for the loss of weapons grade material claiming material inventories are classified."

"The diversity of Y-12 Plant's processes generated large volumes of hazardous and radioactive waste. Inadequate past disposal practices have created serious present day environmental problems. Department of Energy has already spent \$ 1 billion cleaning up Y-12 and adjacent facilities and figures it needs another \$4 billion to complete the job."

From A Citizen's Guide to Oak Ridge produced by the Oak Ridge Environmental Peace Alliance

The name of the company which has been the operator of most of Oak Ridge facilities including the Y-12 plant since 1947:

None other than the butchers of Bhopal: **Union Carbide.**

dustry more efficient. They say they want to let U.S. researchers trade information more easily. They contend that release of the membrane technology alone might increase U.S. exports by \$1 billion per year. And by allowing outsiders to tour parts of Y-12 and other facilities, the officials make another consideration abundantly clear: They desperately need new work. "Sugar Daddy is gone for Y-12," says Albert Stephens, who heads computerized manufacturing at the plant.

The department wants to prove the value of the weapons complex in an age when nuclear weapons production has become less important. Flexible, high precision manufacturing, perfected during decades of bomb making, is the wave of the future for makers of such things as jet planes, engines, machine tools and specialty electronics.

A visit to Y-12 is revealing. At the Alpha One machine shop, which once housed giant magnets for processing uranium, Y-12 managers show off advanced machines and computers used to make and measure parts for nuclear weapons. But most of the shop equipment is hidden behind yellow curtains; so are pallets of finished bomb parts. Workers are nowhere to be seen. The place is library-quiet.

The eerie silence reflects more than secrecy. With the demand for nuclear weapons sagging and environmental problems eating up more of its budget, Y-12 has laid off 11 % of its weapons production workforce during the past one year; employment is down to just 5,855

Undesirable Customers

Weapons based technology, though, could be invaluable to some customers the U.S. would rather shun -Iraq, Libya, Pakistan and other countries trying to build nuclear weapons. Consider the uranium enrichment membranes. These are used to separate uranium-235 from uranium 238. Energy Department intelligence officials say Argentina has tried membrane technology to produce nuclear material, but so far unsuccessfully. The U.S. membranes, which are far more durable than others now available, could help Argentina and other countries make nuclear bombs. So could computerized cutting and assembly tools.

That prospect clearly worries scientists in the weapons complex. Los Alamos National Laboratory has produced a 500 page secret document detailing what is needed to make a nuclear weapon and where to buy it, to help experts block sales. 'It's a Sears catalogue of nuclear weapons,' says Rodney Thurston, a Los Alamos proliferation expert.

Energy Department officials say the benefits of helping U.S. industry outweighs the risks. For enriching uranium, the membrane technology is outdated anyway, they say; most would-be bomb makers now use centrifuges. And the machine tools are far beyond what a first time bomb maker would

need.

Indeed Bryan Siebert, who heads the Energy Department's classification and technology transfer programme, wants to pry the weapons complex open even further. Largely, at his urging, the agency is reviewing nuclear weapons secrecy with a goal of liberalizing the rules by mid-1991. The effort is so controversial, he says, that 90% of the people in classification want to hit me."

Secrecy Interferes with Technology

But he has enlisted powerful allies. One is Dr Edward Teller, the weapon's complex most famous scientist and the father of the hydrogen bomb. Dr. Teller is urging the agency to abandon one category of secrets entirely and to declassify all conceptual information about nuclear weapons that is five years old. "Secrecy doesn't work," he says. "It interferes with the progress of technology."

Now, Y-12 plans to license its technology to any concern that manufactures in the U.S. - a definition that would include most big foreign companies. That proposal enrages Mr Siebert. 'Til keep the Jap. lose out." After 45 years of working on the bomb, he believes that U.S. economy should get some returns for an investment of hundreds of billions of dollars.

False Aura of Profitability

To get back to Mr Ikle and the follies of Atoms for Peace:

"Several misperceptions of the economic aspects of nuclear power also played a role in the spread of weapons capabilities. American reactor manufacturers failed to anticipate that by exporting their technology they would create other exporters that could take future sales away from them. Moreover, the reactor business acquired a false aura of profitability both in the U.S. and in Western Europe, because many of the costs were either borne by the governments or obscured by the size and complexities of large corporations.

The major force behind the Atoms for Peace programme too, was a desire to recover some returns for an investment of billions of dollars into nuclear weapons production, made during the Second World War. The end of the Cold War seems to have provoked precisely the same reaction. As these technologies become more and more widespread, they are bound eventually to find their way sooner or later to not only other nations but also disaffected sub-national groups as well as underworld organisations such as the Mafia. If that prospect gives you the chills, have a glass of ultra-purified water or better still membrane filtered beer, to soothe your nerves. Cheers!

Surendra Gadekar

LETTER BOX

Anumukti Volume 4 Number 2 October/November 1990 arrived in due time informing me to send the subscription for renewal. My views, frankly stated are as follows:

I have no mind to send the subscription money because:

a) I am a lay reader.

b) *Anumukti* is never on time and the excuses for delay sound absolutely hollow. Mere jugglery of words does not serve the purpose.

c) Shri Narayan Desai is nowhere now in *Anumukti* I used to subscribe since Shri Desai used to write off and on in *Anumukti* with his sweet charming easy English giving ample food for thought.

Hari Singh
Jodhpur

I have been following your various efforts through *Anumukti*. My best wishes to your efforts and I hope that it will become loud enough to stop the government from pursuing these mad projects in the name of 'progress'.

I am currently working on a social, economic, political model for India. As a prelude to it I had perforce to understand the various facets of our progress in the last forty years to understand how we had managed to create filth and nothing but filth during this period.

In the course of this work I examined the role of technology in the national advancement of the country. I, like every other informed person had fully accepted the benefits of technology to mankind. (Of course one would draw away from its negative and dirty aspects.) What I saw as a result of my study really shook me. I now believe that technology dazzles and blinds even sensible and sensitive people and hence the mad rush towards technology oriented development. It is, therefore, necessary for people to have a **really good look** at what technology does to people and modify their stance accordingly. None of the scientists, however brilliant they may be in their fields, would have the capacity to get out of their deep trenches of learning and expertise and to take a broader look and see the limitations of technology oriented development. India is a beautiful country - has survived a lot of insane leaderships. I am sure we will surface out of the current chaos much sooner than we imagine.

Sri Sankaran
Pondicherry

I am enclosing with this letter an article by Dr A D Damodaran, Director Regional Research Laboratory, which appeared in *Voice of Electricity Workers* a publication of the Electricity Employees Federation of India a trade union affiliated to CITU. This paper was presented in a seminar organised by the Kerala State Electricity Workers Association at

Ernakulam with a view to win public support for the proposed nuclear reactor in Kerala.

Notice the zeal with which this CSIR scientist advocates nuclearization. Each of his arguments needs a complete rebuttal. The blind enthusiasm of the author to underplay the hazards of nuclear power and to suppress opposition is extremely conspicuous. Can you do some thing about it in *Anumukti*?

K. Ramchandran
Payyanur

The length of Dr Damodaran's paper (more than four and a half pages - and that is just the excerpts - prevents us from publishing it in full for a detailed rebuttal. However, most of his arguments are old hat and have been refuted many times previously in Anumukti. I will comment on a few of them since they are nowadays being repeated ad-nauseam by nucleocrats in advertisements.

Other countries have a much larger share of nuclear electricity.

"Europe outside of USSR (an area almost equal to India) has 183 power reactors and also 106 research reactors thus making a total of 209 reactors in all. France has 55 reactors in a country more or less the size of Tamil Nadu.

No comments on his mathematical powers! It could have been a typographical error. Geography, he fails! (Tamil Nadu area is 129,900 sq km while the area of France is 547,033 sq km)

He does not for some reason mention the reactors on the submarines in their waters but they too would be a substantial number - well into hundreds. All these countries got deeper into the nuclear hole faster than we did and now do not know how to get out without a great strain on their economies. But the fact is, that all of them, France included are trying not to get in any deeper. Last year no OECD nation ordered a nuclear reactor with the sole exception of Japan. (See the story on Japanese nuclear power programme in this issue.)

**** Nuclear electricity is cheap"**

"French electricity which is almost three quarters nuclear is the cheapest in Europe."

The great secret of "cheap" nuclear electricity can be revealed in just two words — hidden subsidies! (See the story on British nuclear costs in this issue). The French electricity board - Electricite du France - has a debt that puts the debt of some Latin American nations to shame. Even its chairman has admitted that last year had been "disastrous" from a financial point of view.*

Demonstrated competence

"With over 70 reactor-years of experience, we are well poised to manage safely these otherwise complex systems."

The US had already accumulated hundreds of reactor-years of experience before the accident at Three Mile Island as had the Russians before Chernobyl. That we haven't had a great big disaster till now is more an indicator of the fact that we have had very little experience. Of these seventy reactor-years nearly ten reactor-years should be deducted since they refer to RAPP-1 which was essentially in a shut down condition. (See the story on RAPP -1 in this issue).

Indian reactors are safer

"Indian reactors have a number of features which make accident conditions highly improbable among them negative power coefficient of reactivity which ensures that the reactor shuts down in case of a power excursion."

It is shameful for a senior scientist like Dr Damodaran to make statements that are factually erroneous. Whether he has done this deliberately or out of sheer ignorance is besides the point. The mainstay of the Indian nuclear programme the CANDU type reactors have a positive reactivity coefficient. Thus in case of a loss of coolant during a power excursion the reactor instead of shutting down would produce still greater power causing a Chernobyl type disaster. (See Chernobyl Reactor's Next of Kin in this issue)

No Alternatives

"Be it hydro, be it thermal or be it nuclear there are always groups to protest with a common advice

to go for solar wind, wave and minihydro sources, when none of them have been accepted for this role by any nation on earth !"

NAVAL ACCIDENT

In May 1985, an accident occurred in a Soviet nuclear-powered sub-marine at the dock at the Pacific coast settlement of Dunay (also in the Soviet Far East, and 35 miles east of Vladivostok). A letter to the Soviet weekly magazine "Ogonyok" which describes the accident says that an explosion of the submarine's nuclear power unit caused radioactive contamination of the Amur Gulf, where the submarine was being repaired.

According to another report, from "Information Update" (a bulletin put out by the Pacific Campaign to Disarm the Seas), residents of the area claim that while the sub was being refuelled, the lid of the reactor was forced off prematurely, due either to an explosion and fire or to the reactor starting up accidentally. Several people were killed and the submarine sank at dockside. The dock was so badly contaminated that it is still unusable. It is not known what happened to the submarine, but the radiation has migrated. The contaminated area is about 100 meters wide and 600 meters long. Cleanup of the site has involved removal of 2000 cubic meters of contaminated material to a temporary dump site in the area. Another 200 square meters was cleared away last year. No decision has been made as to final disposal of the contaminated material.

Local residents are continuing their protests. The letter published in "Ogonyok" was signed by 116 residents from Dunay and claims that there are many more cases of similar accidents which have also been covered up. Deputies in the region who have been investigating the accident have also denounced the military's environmental record, claiming that the temporary site and other waste dumps in the area are neither well protected nor safe. The deputy from Dunay said local people had broken through fences around the area to walk or gather mushrooms. He noted, "We need somebody to protect us from the military."

During just five years, the State of California installed more than 10,000 MW of power from precisely just these sources. 10,000 MW is what the Indian nuclear programme hopes to achieve by the year 2000 A.D. under a fifteen year plan and it is a good bet that it would fail. We do not suffer from a lack of sources of energy : what we do suffer from is a lack of imagination on part of our scientists and technologists who cannot conceive of a source of power which is not centralized and hence under their control.

Public Debates: A Waste of Time

"Public involvement on crucial development issues is a must and is a healthy trend. However this involvement has to be converted into a constructive methodology, failing which the so-called involvement will only end up in endless debates, qualitative, emotional and many a time even self-defeating. Hence the normal practice in many countries, specifically the advanced ones, is to appoint appropriate bodies consisting of professionals, public men, elected representatives of the people, concerned experts, etc., based on which a policy is announced in the forms of White Papers, which forms action plans about which no more debates are encouraged save exceptional new situations. Unless our Governments start these well tried out practices, we would not be able to undertake any serious developmental programmes.

It is precisely this kind of 'guided democracy' that has made an ecological disaster area out of Eastern Europe and Soviet Union. Professionals have demonstrated a professional ability to pick the just fruits of development for themselves without getting pricked by the thorns ! That is what the debate is all about. Mere lip service to "public involvement in development" will no longer suffice. There has to be a real devolution of power.

NOTICE BOARD

Chernobyl Day Event

Citizens for Alternatives to Nuclear Energy (CANE) a Bangalore based antinuclear group is organising a three day workshop on nuclear energy and people's movements on April 26 to April 28, 1991 in Bangalore.

We feel that it would be very useful for the people/groups engaged in questioning the nuclear establishment to get together for a good sharing. We believe that we have a lot to learn from one another. Various groups/individuals are doing much more than what gets communicated to the rest.

In the three days at the workshop we hope to have

- good sharing on our strengths and weaknesses
- critical reflection on the methodologies that we use as public interest movements
- a close look at the threats we face
- learn more about various aspects of nuclear power from scientists
- get to know one another better so that we know where we can draw support from in times of need

We would like each group to be represented by two persons, one who has been taking primary responsibility and another who can step into that position when the need arises. Although we know that it would be difficult for most groups and individuals to meet all the expenses to come to Bangalore, we are unable to offer any subsidy to meet travel costs from our side. In case of dire need, please try and find a local sponsor and also inform us and we too would try to find someone to help partially meet travel expenses. But we would really like that you make your best efforts to come.

Contact Address: K.Krupa

CANE, 809, 17 E Main, Rajaji Nagar, 5th Block
Bangalore 560010₂

International Women's Day

BAILANCHO SAAD, a women's group from Goa, is organising a function at Panjim to commemorate International Women's Day on March 8th, 1991. The theme of the function will be "Nuclear Energy and Women" The programme includes two talks by antinuclear women activists and a slide show with slides on Kaiga nuclear power plant.

Rally Against Koodankulam

Murpokku Manavar Sangam and Murpokku Ilaignar Ani, two associations of progressive students and youth held a cycle rally against the Koodankulam nuclear power plant starting from Madras on January 30th, 1991. Their programme included halts and meetings at many places on the way including Vellore, Dharmapuri, Coimbatore, Ramanandapuram and Madurai. They converged on Tirunelveli on 10th of February, where there was a public meeting followed by a cultural programme by Jan Natya Mandali.

T.Sengadir and T.Vinmeen Pandian

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