ANUMUKTI

A J urnol Devoted to Non-Nuclear India

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The B and palnt of Mice and Men

Consider the following:
"Radioactive material transport has maintained an excellent record of safety in India. This is primarily due to strict enforcement of national regulations. The regulations emphasize on the bulit-in safety of packages rather than operational controls in order to ensure that the transport workers and members of the public are adequately protected against radiation hazards in normal as well as accidental conditions of transport. The packaging containing radioactive materia shall be designed to withstand the rigours of transport

"The number of radioactive material packages transported in India increased from about 12,600 packages in 1961 to over 24,000 in 1992. It is estimated that more than 10 million packages are transported each year throughout the world

'In India, the Chairman, Atomic Energy Regulatory Board (AERB), is the competent authority for enforcing regulations relating to radiation safety including transport Transport of radioactive materials is governed by the surveillance procedures issued under the Radiation Protection Rules, 1971 and the safety code, AERBATR-1, 1986 issued by AERB. The safety code is based on the international standard of International Atomic Energy Agency (IAEA). The IAEA regulations are incorporated in regulations of various international organisations such as International Air Transport Association (IATA), International Civil Aviation Organisation (ICAO), International Maritime Organisation (EMO), Universal Postal Union (UPU) etc. and national regulations of member states."

I am quoting all this from an unimpeachable source—Newsletter of the Atomic Energy Regulatory Board. Now consider this:
"During month of October, 1993 a radiography agency collected a 1.6 TBq (43Cis) Ir-192 source in a Techops-660 camera. The above camera was packed in a steel trunk along with accessories and was taken to railway station to be taken to a radiography site. The above parcel was booked in a brake-van without any mention of the nature of the contents or declaring its correct value. Alter handing over the trunk containing lechops-camera to parcel clerk the radiographer did not check whether the above parcel was booked in a particular train. He did not travel by the train in which the parcel was supposed to have been loaded. Immediately upon arriving he did not check whether the parcel containing the radioactive material has reached or not. Next day morning when he went to collect the above parcel he was told by railway official* that it is missing. The loss of the radiography camera along with source could have been avoided if the accepted secure mode of transport had been used. The radiographer leaving the parcel in the booking office was away from the station for a longtime.

"Radiation Protection Services Division was not informed immediately by the party of the missing camera containing source. Nearly ten days later a search using radiation detection equipment was carried out but with no success. Scrap dealers shops have also been checked for missing source.*

Action en

"The radi raphy agency was asked to suspend the radiography operations and return all radiography sources immediately."

The above is taken from another unimpeachable souce: An information notice issued by the Radiation Protection Services Division of the Bhabha Atomic Research Centre and sent to all users of industrial gamma radiography sources.

Remember Galania

Around the end of 1985, a private radiotherapy institute, the Institute Goiano de Radioterapia in Goiania, Brazil, moved to new premises, taking with it a cobalt-60 teletherapy unit and leaving in place a caesium-137 teletherapy unit without notifying the licensing authority as required under the terms of the institutes license. The former premises were subsequently partly demolished. On 13 September 1987, two people entered the premises and thinking that the unit might have some scrap value, removed the source assembly which they took home and tried to dismantle. In the attempt the source capsule was ruptured. The remnants of the source assembly were sold for scrap to a junkyard owner. He noticed that the source material glowed blue in the dark. Several persons were fascinated by this and over a period of days friends and relatives came and saw the phenomenon. Fragments of the source the size of rice grains were distributed to several families. This proceeded for five days, by which time a number of people were showing gastrointestinal symptoms arising from their exposure to radiation from the source.

The symptoms were not initially recognised as being due to irradiation. However, one of the persons irradiated connected the illnesses with the source capsule and took the remnants to the public health department in the city. This action began a chain of events which led to the discovery of the accident, which was one of the most serious radiological accidents ever to have occurred. In all over 112,000 persons were monitored, of whom 249 were found to be contaminated either internally or externally, 20 persons required hospitalization and four people died of acute radiation syndrome within four weeks of the accident. (The Bulletin of the International Atomic Energy Agency)

So, here we have this 43 Curies Iridium-192 source which is lost'. The 'action taken[1] in this case is a typical instance of the way corporate polluters are 'punished'. Even the name of the radiography unit involved in this grossly irresponsible act has not been mentioned lest it give offense. Is that a way these companies using horridly dangerous substances can be made to mend their ways? Iridium-192 gives out strong gamma rays which require a shielding of one to six centimetres of steel. It also gives out beta rays which can cause skin burns. Iriaium-192 has a half-life of 74 days which means that it would be two to four years before its radioactivity decays to about one millionth of its present value. 43 Curies is a huge amount of radioactivity. For comparison sake, the radioactive sources which had been dumped in the river Cooum in Madras last September (See Much a Dooum on the Cooum in Anumukti Vol. 7 No. 2 October/November 93) according to the publication Nuclear India of the Department of Atomic Energy were 1.5 Curies—caesium, 18 and 0.5 Curies—Americium-Beryllium neutron sources respectively To recover these sources, the Atomic Energy Regulatory Board showed exemplary alertness and these were recovered after a month of intensive effort and the expenditure of about 40 lakhs of rupees. What does Dr. Gopalakrishnan, the AERB supremo propose to do to mitigate this new menace and recover this radioactive camera, or does he find the slush and stink of the Cooum more congenial than the chaos that is Indian Railways?

From The Editor's 'Desk

There was a time when Gujarat was the land of Gandhi, Jinnah and Sardar—a land that taught the world that courtsey and good manners in dealing with one's opponents were not a sign of weakness but of strength. One could be totally uncompromising in one's adherance to a principled stand, be the Iron Man of India and yet combine this mule-like stubbornness with grace and magnanimity that would charm one's most intractable opponents. Alas, those days are history. Today's Gujarat is not the land of the old Sardar but of the new, self-styled one. Anti-social boors rule the roost using muscle and money power with active connivance of state machinary.

The incident at Barod vhere thugs masquerading as political activists vandalised the office of mada Bachao Andolan is an outrage even in these devalued times.' fact that some sections of the Gujarati press, hailed the attack only derscores the total moral bankruptcy that engulfs even so called 'ectuals. However, the forthright condemnation of the attack by so the staunchest supporters of the dam is a silver lining. It is high the innate good sense amongst the ordinary people of Gu, lf and a halt is cried to this goose-step march in Hitler's footsteps.

Old Reactors Never Die
Neither Do They Just Fade Away.

It is High Time Tarapur Was Decommissioned

Nucleocrata who decided to commission the two Boiling Water Reactors (BWR) at Tarapur on 1st April 1969, knew what they were doing. They were playing a huge practical joke on the nation in keeping with the traditions long associated with the date.

The decision to Ibuild a nuclear power station in the Western region was taken in 1968. TVirapur, 100km north of Bombay was chosen as a site in August I960. Preliminary agreeents uild TAPS were signed in August 1963. Each unit was to be similar to the Dresden-1 reactor which had been built by GE and completed in 1960. A loan of 80 million dollars was made by USAID toward the reactor cost and the fabrication of the initial fuel charge. This came at an interest rate of 3/4% and repayment was to be over a thirty year period beginning June 1976. Construction began in October 1964 and GE gave a firm completion date of October 1968 as well as guarantees about the output and the efficiency of the station. But a problem arose in 1968 when it was found that cracks had appeared in certain stainless steel components connected with the reactor vessel. This problem also occurred in a similar plant built at Oyster Creek, New Jersey. A programme of repair and modification was carried out at the expense of the contractor. Mainly as a result of this problem the completion of TAPS was delayed to October 1969, in which month it came to full power and produced commercial electricity for the first time. In compensation for the delay GE paid damages of Rs. 1.2 million. However, a bonus of Rs. 26 million was paid to GE on account of the net electric output being rated higher than specified in the contract (400 MWe rather than 380 MWe).

Operpting History

The Tarapur reactors have earned the distinction of being labeled the distiest reactors in the world" This designation is amply justified by a quick glance at its operating history. Radiation contamination of the reactor building and its environs has been hundreds of times higher than the design intent. Consequently, the radiation dose received by workers has been extremely high. In the initial years, TAPS was manned by a few hundred workers, (560 in 1970) who received a collective dose of 153 rems. In just a few years, the number of workers had increased sevenfold and the collective dose they got had also jumped ten times to 5,057 rems in 1977. The reason for the expansion in the regular workforce and the explosion in the population of 'casual* workers has been the need to keep occupational doses within internationally accepted limits set by ICRP. A comparison of radiation doses received by workers in Tarapur compared with dories received by workers at Dresden-1 plant (which was the 'prototype' plant whose technology was almost ten years older,) is shocking O*ver* the years 1960 to 1970 exposure level at Dresden-1 normalised for electricity production were ten to fifteen times lower than those at TAPS,

Other' objective' criteria like capacity factors, the rate of forced shutdowns, 'unusual incident rate'. the amount of high level radioactive wastes stored at the station, the amount of low-level radioactive waste discharged to the environment, the amount of average 'down' time of the reactor, etc. all show that TAPS fares poorly in comparison with U.S. reactors of the same Vintage' However, since the performance of other Indian reactors of the CANDU type has been even more dismal, Indian nucleocrata have a great fondness for TAPS and are inordinately proud of it.

In 1984 unit-2, and in 1985 unit 1 of TAPS were both officially 'derated' to a capacity of 160 MWe each This was done because ofT irreparable leaks in the secondary steam generators which were isolated and taken out from the system. However, as a result of this, the moisture content of the steam has increased inside the turbines and has resulted in extensive corrosion/erosion of turbine parts including the blades. Erosion problems are not a new phenomena at TAPS, and had begun to appear even during the preliminary stage of reactor operations.

"Not A Quality Product"

TAPS reactors were built at the same time as the reactor at Oyster Creek in New Jersey, U.S.A The Oyster Creek plant suffered the same problems of cracking of stainless steel components of its reactor vessel that delayed Tarapur Thus, a look at Oyster Creek's performance in the U.S. context and its comparison with TAPS can provide a useful insight. Below we quote from a re-

cent assesk ent of Oyster Creek brought out . a briefing paper by Nuclear Infomtion and Resource Service.

Oyster Creek is lagued by a history of poor operai ng performance and high operatioy and maintenance costs. According to the U.S. Department of Energy, the routine day-to -day expense to run Oyster Creek over a two year combined average for 1990 and 1991 was over 105 million, ranking it the fifth most expensive reactor to rate payers at $ 162 per kilowatt.

The New Jersey Department of the Public Advocate, Division of Rate Counsel concluded in July, 1990 testimony before the New Jersey Board of Public Utilities that, based on the historical operating performance and costs of the Oyster Creek reactor, "early retirement of the plant and the installation of replacement power would be less expensive to the rate payer than continued operation through the remainder of its planned service life" by as much as $ 1 billion if it were shut down today.

Oyster Creek is one of the most radioactively "dirty" nuclear reactors in the country. From 1988 to 1989, the reactor ranked highest in the nation for worker exposure to radiation, and third highest in the nation with the combined averages for the years 1990 to 1992. Oyster Creek routinely releases radioactive gases and particulates as part of its normal operations. According to NRC documents, nearly all of these releases to the environment are deliberate, ranging from 249 curies in 1989 to over 1 million curies in 1979.

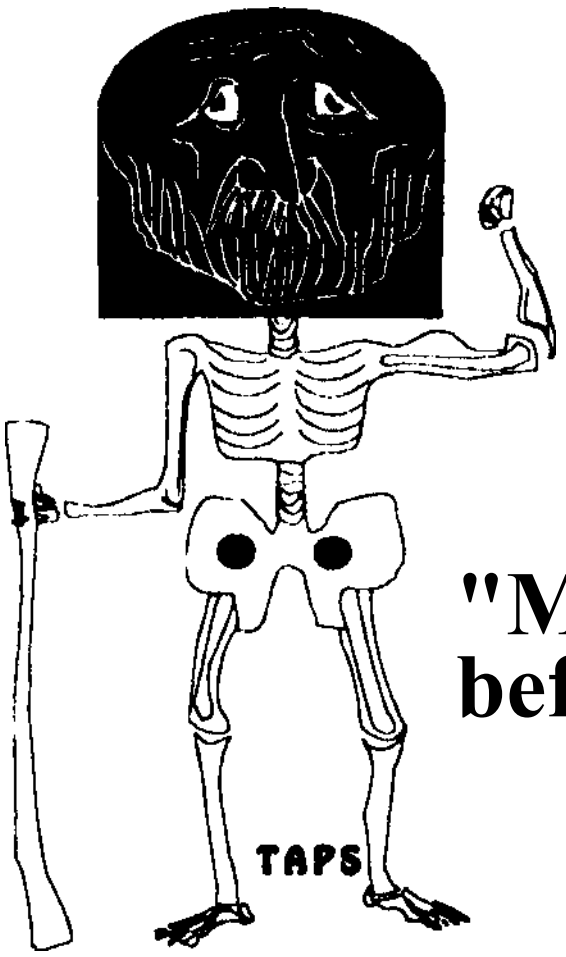
The Nuclear Regulatory Commission (NRC) has identified Oyster Creek as one of fifteen reactors where the reactor vessels are so weakened by radiation that the reactors'safety have been called further into question. NRC now believes that Oyster Creek may be susceptible, along with other GE Mark 1 reactors, to cracking of certain reactor vessel internals as a result of high radiation exposure. Two Mark l's in North Carolina were discovered to have cracks in the reactor core shroud which under certain conditions could shift and prevent the control rods from shutting the plant down. These cracks are obvious signs of premature aging that further indicate the need to retire these reactors.

A containment that does not contain

In an effort to gain a cost competitive edge, GE decided to build a smaller containment building than its rivals, opting for a "pressure suppression" system which tiades off large containment buildings for pools of water under the reactor designed to condense steam buildup during a core melt accident. This design has caused concern among regulatory officials, as studies have shown that its containment is virtually certain to fail during accident conditions in "as early as forty minutes." In fact, in 1986, the former head of the Nuclear Regulatory Commission (NRC) office of Nuclear Reactor Regulation, Harold Denton, told an industry trade group that there was a 90% probability that the Mark 1 containment would fail in an accident involving a core melt accident.

As early as 1975, three General Electric engineers wrote an internal report highly critical of their own company's nuclear reactors. The Reed Report, as it became known, was kept secret by GE and the NRC until 1987, when it was released under pressure of state and local governments and safe energy organisations. The GE engineers detailed dozens of safety and economic problems with the reactor design, concluding that GE reactors are "not a quality product."

However, Oyster Creek performance using the objective criteria mentioned earlier, shines in comparison to that of TAPS.



"Miles to go before I sleep"

A Potent New Danger

Lethally radioactive and thermally hot nuclear waste in the form of irradiated fuel rods from commercial reactors is being stockpiled in ever increasing volumes at nuclear power plants in the absence of a viable technology for its long term management. These radioactive fuel rods are removed from the reactor core and placed underwater in large storage pools to cool the fuel and to shield the environment from the intense radiation. Many reactor sites now have exceeded by several times the original design capacity of their storage pools.

On October 1, 1993 David Lochbaum and Michael Prevatte, two engineers working to raise the power output of a similar Boiling Water .Reactor at Susquehanna, Pennslvania formally presented findings to the NRC that potentially affect all Boiling Water Reactors (BWR) in the United States as well as a number of GE BWRs overseas. Lochbaum and Prevatte found that in general, GE's Boiling Water Reactors have serious design defects for handling loss of coolant water to the fuel pool associated with a credible Loss of Coolant Accident (LOCA) in the reactor.

These defects can produce potentially catastrophic results, including:

- The melting of the fuel in the pool which is located outside reactor containment.
- The failure of the reactor vessel and all reactor building safety systems.
- The failure of all radiation containment systems.
- The Loss of Off-Site Power (LOOP) associated with a LOCA or a combination of these events at the reactor which could lead to the boiling of the coolant in the fuel pool. As one example, the activation of the emergency core cooling system (ECCS) forcing water on a super hot reactor core would create a large hydrodynamic force (much like experiencing a giant "ting" in a home hot water radiator) in the steam suppression system of the plant, essential feed water pipes to the fuel pool are not seismologically qualified to hold up to postulated forces generated by this hydrodynamic force and could break, additionally, Lochbaum and Prevatte identified other design deficiencies involving the power systems to the fuel pool cooling and makeup water pump system that could be de-energized by a "load shed" mechanism associated" with a LOCA. In many reactors, like Susquehanna, plant operators would then need to open manually operated valves to provide emergency water to the fuel pool. The radiation fields could be on the order of 5000 rems/hr, posing certain death to operators attempting these "heroic measures." The resulting failure of this system would be the boUing off of cooling water to the irradiated fuel storage pool and the meltdown of several hundred tons of irradiated fuel /nuclear waste, resulting in an unanalysed catastrophic release of radioactivity off-site to the environment.

The boil off of the fuel pool cooling water itself would further challenge additional plant system design deficiencies. For example, the heating, ventilation, and air conditioning ductwork for the reactor building is not designed to handle the large volumes of condensation created by the boil off, causing the system to fail because of condensate accumulation or blockage. Safety equipment in the reactor building is not qualified for the temperatures and water collection potentially resulting from the failure of this sys n. Lochbaum and Prevatte cone ded that in a rapid cascade of e ents, safety systems would then fail, resulting in the melting of the reactor core, failure of the reactor veesri, failure of primary and secondary ontainment, and ultimately release of catastrophic amounts of ralioactivity to the environment.

The two engineers have urged the Nuclear Regulatory Commission to order the "backfit," or repair, of the Susquehanna reactors and perhaps 30 other reactors of similar design

A Pox on MOX

Instead of quietly celebrating completing 25 years of operation and closing down the reactors forthwith, Indian nucleocrats have decided to continue this folly further. They have spurned an excellent excuse for shutting down the reactors since the French who had been supplying the enriched uranium fuel till now have decided to no longer continue to do so. The decision to replace some of the enriched uranium fuel which is not available in India, with Indian manufactured Mixed Oxide (MOX) fuel is an act of unprecedented criminal irresponsibility

There are problems galore with MOX. Here we mention just a few of them.

- Manufacture of MOX fuel elements leads to higher radiation doses to operators than does manufacture of uranium fuel This is mainly due to the neutron radiation from Pu-inotopes and to the gamma radiation emitted by Americium-241, a daughter product of Plutonium-241. Furthermore, there is the risk of plutonium inhalation if leak tight containment of plutonium is not strictly maintained at all stages of the manufacturing process.

- During ' roceasing and fuel fabrication the risk of plutonium theft , particularly high. During those stages, plutonium is handled and processed as a solution or powder, in quantities of several tonne per year. Current systems of physical protection and material recounting are not sufficiently efffective to prevent the "loss" of several kilograms of plutonium per tonne during the process; they are not even sufficiently accurate to detect such a diversion with reasonable certainty after it has taken place.

- The transport of fresh MOX fuel also constitutes a significant security risk. Two typical fresh BWR-MOX fuel elements, for example, contain more plutonium than is required for the construction of an atomic bomb. And separation of plutonium from fresh fuel rods is much easier than the reprocessing of spent fuel. Fresh MOX fuel could therefore be a highly attractive target for criminal or terrorist groups, or for the agents of states wishing to obtain plutonium. These considerations also apply to the transport of plutonium oxide, which has to be transported, after separation, from the reprocessing plant to the MOX fuel fabrication site.

- The use of MOX fuel in BWRs which were originally designed for uranium fuel only creates additional difficulties. The regulation of the neutron flow in the reactor is made more complicated, in particular due to the neutron absorbing effect of several Plutonium isotopes and Americium-241. The effectiveness of the neutron absorbing control rods is consequently reduced. In order to compensate for this effect, the number of control rods must be increased. There are also a number of further potential safety problems which require compensatory measures as the proportion of MOX in the core increases. The result is that only a maximum of about 30-60% MOX fuel can be loaded into a reactor core under present circumstances.

- Spent MOX fuel is more difficult to transport and store than spent uranium fuel. Due to its higher actinide content, the neutron radiation emitted from spent MOX fuel is much more intense. Even in shielded transport containers, the dose rate at a distance of 1 metre from the transport cask is about twice as high for spent MOX fuel as for spent uranium. This leads to higher radiation exposure not only for transport workers and security staff accompanying the casks, but also for people living along the transport routes.

- MOX also creates additional problems in the final disposal of its waste. The long-term toxicity of the wastes from MOX reprocessing is higher, as is their rate of heat generation. High-level waste from MOX fuel emits about 7 times more heat, per tonne of spent fuel, than does high-level waste from uranium fuel. In the case of direct disposal, without reprocessing, spent MOX fuel generates about 5 to 6 times more heat than spent uranium. Much larger volumes of rock are therefore required in an underground repository in which to position MOX waste or MOX fuel in order to avoid excessively high temperatures, in any case, plutonium recycling in BWRs cannot go on indefinitely. With each cycle, the plutonium becomes more contaminated, and its isotopic composition less favourable. Hence, MOX fuel will have to be disposed of directly anyway, after two *or* three cycles at the most.

- The fact that so many safety and engineering problems are associated with the use of MOX fuel also leads to the inevitable consequence that its use in BWRs is much more expensive than ordinary uranium. Additional shielding and control measures for processing and handling, extra precautions against incorporation of plutonium (for example by inhalation of contaminated dust), as well as extensive security measures all add up to high costs.

A New Era of Hindi-Chini Bhai Bhal

In all the highly glowing accounts of the ingenuity of Indian scientists and their great contribution to the cause of ' self reliance', nobody has seen fit to mention the fact that MOX fuel cannot replace more than 30% for the enriched uranium fuel which was being imported from France and for which there is no available local substitute. What is TAPS going to use for the rest? U.S. and France, who had been supplying the fuel till recently have now declared that they have no intention of supplying till India signs the Nuclear Non-Proliferation Treaty and accepts full-scope safeguards with IAEA inspectors snooping every corner. Recent reports in the Nucleonics Week, the nuclear industry trade journal suggest that it is our old long-lost friends, the Chinese who have assured us that they would step in to fill the breach. Politics, it is said makes strange bedfellows. Nuclear policy makes them stranger still.

Surendra Gadekar
Based on reports from Nuclear Information Resource Service, Nuclear Engineering International, Greenpeace and Nucleonics Week

Aging Problems of Indian Nuclear Plants

An Official View

Our craze for 'phoren is absolutely astounding. Not only do we crave for foreign goods and marry our daughters to foreign returned bridegrooms; not only do we try ingenious tricks to immigrate to foreign shores and in lieu of success in these endeavours watch foreign TV programmes; we give serious consideration only to foreign criticism. Recently, a U.S. TV network, CBS, broadcast a film on India's nuclear power stations entitled "Another Chernobyl?" The film described the Indian nuclear programme as the most dangerous in the world and cited numerous 'instances' of unsafe operating practices at Indian nuclear power plants. It is a sad commentary that this one programme on a foreign TV network has raised more comment in the Indian press than all the reports on Rawatbhata and the BARC leaks put together. Below we reproduce the excerpts from an article by Dr. AGopalakrishnan regarding the defects besetting the Indian nuclear programme. The fact that nucleocrats are now willing to publicly admit that all is not hunky-dory with the programme and even the head of the nuclear establishment Dr. RChidambaram is now pleading for extra funds on such pusillanimous grounds that "the gains made with such efforts in the past should not be allowed to be frittered away", is an indication of the paradigm shift that has already taken place.*

Aging of critical subsystems, structures and components in nuclear power plants, if not closely monitored and checked, could lead to incidents which might have an adverse impact on public health. Let us see what is the status of a comprehensive list of safety-related critical structures, subsystems and components in our Nuclear Power Plants.

In the case of the Tarapur station, there seems to be a somewhat complete list on which everybody (researchers, designers, operators and regulators) agrees. Of course, these are General Electric Boiling Water Reactor (BWR) Stations for which similar information is available from elsewhere for comparison and everything seems to be in good shape. As regards the other 235 MWe Pressurised Heavy Water Reactors (PHWRs), discussions indicate that there is not much of a consensus on the total list among any of the groups, even though everyone agrees on most of the major and obvious constituents such as the pressure tubes, calandria tubes, containment, emergency core cooling systems etc

Unit-2 of the Rajasthan Atomic Power Plant (RAPP 2) and both the units of the Madras Atomic Power Plant (MAPP-1&2) have seen the highest full-power years of operation. A matter of concern in these reactors is the sagging of the pressure tubes. The pressure tubes contain the fuel bundles and the safety concern arises from the fact that such Bagging could lead to contact between the pressure tubes and their reactor vessel tubes, causing enhanced hydrogen embrittlement and the failure of the pressure tubes. The indirect monitoring of the gaps between several pressure tubes and calandria tubes in RAPP-2 has shown the possibility that in several channels the likely contact may have already occurred. Complete in-service inspection of all suspected pressure tubes is currently on.

A great deal of meeting of minds is required between the Bhabha Atomic Research Centre (BARC) and Nuclear Power Corporation (NFC) teams on what are the major safety related issues in the pressurised heavy water plants The vagueness and incompleteness which appear to exist in this area can be removed quickly through collective effort.

Environment and stresses in reactor systems are not easy to characterise. Instrumentation and sensors exist only in limited locations, and in the older plants some of these may be in a non-repairable state. There is very little option but to examine in detail the plant data records, and take help of analytical interpolation between the transient variations in known locations through the use of plant dynamic modelling. A reasonably good model has been developed by the NPC, which is presently under verification. Again, there is ne*ed* to create a careful data bank of environmental changes and associated list of specific stressors which each critical item of each nuclear power plant unit has seen, from the beginning to the present. This is a somewhat painful task now, since such details may not have been kept track of. All the same, creation of this essential data base can no longer be avoided

One often Hi rs statements to the effect that "cob. -benefit aspects" of safety should also be kept in mind by regulatory agencies. If these are to mean that safety stipulations should only be insisted to the extent they can be implemented inder the existing financial constraints of the nuclear facility owner, talking into account the difficulties in getting suitable imported spare parts and indigenous technologies, it just cannot be agreed to. The larger "cost" of potentially impairing the public health and safety should be **the** predominant concern. There can be no negotiation or compromise on lowering the safety standards and norms below internationally acceptable levels, in order to accommodate the unfortunate limitations faced by the facility owner.

Aging related work is of growing importance and it should certainly receive emphasis and larger diversion of funds as time progresses. The formation of a multi-disciplinary task force comprising the NPC, the BARC/IGCAR (Indira Gandhi Centre for Atomic Research) and the AERB, on a full time basis, who can be entrusted with devising a definite and well-knitted programme of activity, should be considered.

Dr. AGopalakrishnan
Atomic Energy Regulatory Board

The Dark Heart of the Nuclear State

The following are excerpts from an article "Burning the house to light a dinner candle" which appeared in a Pakistani newspaper The News.

The peaceful nuclear programme in Pakistan is supposed to be directed towards using nuclear power to generate electricity. The early promise of cheap (perhaps even free), safe, unlimited electricity produced in nuclear power stations is now like a fairy-tale. It stands revealed as a bar gain with the devil, selling the future for the gratification of the here and now. Using nuclear power to make electricity is like burning down your own house to have light to eat your dinner by. (The same image can be used to view nuclear weapons. They amount to soaking yourself and your family in petrol, lighting a match, and saying come on then attack me if you dare.) These aspects have become so clear that nuclear power is on the run in the very countries that pioneered the technology and developed it.

As if intent on repeating every mistake that has ever been made the Pakistani state machine pursues a "nuclear programme" and justifies it in the same tired old western terms. The debate on this issue in Pakistan is restricted. It is as if everyone taking part in it had accepted a set of limits as to what can and cannot be said, and since the limits of debate are set in advance it is no surprise that the same old arguments go around. The reasons given for pursuing the nuclear power programme the raw material, Uranium is in relative abundance compared to oil and gas. Secondly, the power generation process in reliable com} ared to hydroelectric (no load shedding). Thirdly, it has a positive effect on the scientific and technological capability of the state. The acute problems concerning the radioactive contamination of people, of land, air and water for time scales much longer than any other human effect on the environment, which have effectively killed off the nuclear programmes in most Western countries, merit little attention in Pakistan.

Why then, despite the worldwide catalogue of disasters and tragic experiences with nuclear programmes, does a country like Pakistan persist in its "nuclear capability"? In part it is because there is so little real informed debate. How much public debate has there been, for example, on the 300 MW nuclear power station to be built by the Chinese at Chashma? How many people know that this is the only Chinese designed reactor, that there is only one like it in China and that too is only at a trial stage? This design has no history of reliable operation and consequently no-one has experience with its operating characteristics, it is worth thinking about that the Chinese nuclear are relying on reactors build with foreign technology for use in China, rather than using their own design.. Is Pakistan a test-site for Chinese nuclear technology? If anything goes wrong who will pay the price?

The Pakistani nuclear programme is sheltered close to the heart of the state, it is controlled through the Atomic Energy Commission by the Prime Minister's Secretariat, the light of accountability is never allowed to shine in on it. There may be several reasons; perhaps it's because nuclear physicists are such delicate flowers and need to be protected and sheltered; or perhaps it's because those kind, thoughtful people don't want to burden us with all that nuclear physics, which is really too hard for the rest of us to understand. Whatever the reasons, in this darkness, away from the public gaze fierce monsters breed and grow fat and claim, like dragons, to guard a great magical treasure. This is common to all nuclear programmes. All "they" have to do is say the magic words "the National Interest" and everyone goes quiet.

Dr.Zia Mian
The News February 3,1994

The Risks of Old Reactors

On September 21, 1990, the operator at Tennessee Valley Authority Sequoyah Unit 1 nuclear power plant heard something that sounded like a freight train. Seventeen days later the plant was shut down after X-rays revealed that the disc of a check valve in the main steam line was missing. Such check valves are used to prevent reverse flow of steam into'the containment building in the event of a steam-pipe break. The 28-inch diameter disc, weighing several hundred pounds, had broken off and gone bouncing through the main steam pipe. Inspection of the other three check valves in the main steam lines to the turbine showed that two other discs had also broken off.

The Aging Process

Sequoyah Unit 1 is only 12 years old. Yet the check valve incident resulted from age-related degradation of the nuclear plant equipment-degradation that went undetected by routine testing and inspection measures.

The U.S. Nuclear Regulatory Commission (NRC) defines aging as the cumulative degradation of structures, systems, and components over time. Factors that contribute to the aging process include normal wear and vibration; improper installation, use, or maintenance; and conditions under which the system or components have operated. If the effect of aging go undetected or unchecked, they could lead to equipment failures, accidents, or other abnormal plant conditions that could jeopardize safety.

Two major safety problems can result from nuclear plant aging: The probability of an accident (such as a pipe break) can increase, and the probability of the failure of safety systems (such as emergency core cooling) can increase, as well. Age related deterioration of equipment can also result in accidents that are more severe than the safety systems were designed to handle.

In theory, the adverse effect of aging can be corrected by maintenance, repair or replacement of the affected components. For this to successful, however, the causes of the aging must be known; testing and inspection must be capable of detecting the age-related degradation; and the costs of the additional maintenance, repairs, and replacement must be economical enough to warrant continued operation of the plant.

The NRC and the nuclear industry claims that the causes and effects of aging are understood and that routine testing and maintenance are adequate to detect and correct these effects. In 1989, however, the US General Accounting Office reported to congress that:

- Neither the NRC nor the nuclear industry fully understands the nature and effects of aging on nuclear power plants;
- The operating and maintenance practices of each utility are different.
- Each plant has a unique history of operating conditions and minor accidents that can accelerate aging by inadequate maintenance, improper testing and abnormal operating conditions.

In addition, the experience in nuclear plants shows that aging is increasingly the cause of accidents, equipment failures, lengthy plant shutdowns, and expansive repair, and that current testing and maintenance practices ire inadequate to prevent age-relat d failures.

Failures Due to Aging

Many mechanisms contribute to the deterioration of nuclear plant equipment, and virtually every component in a plant is degraded by one or more of those mechanisms. Different types of aging degradation include and sliding surfaces, which can be accelerated by inadequate lubrication, use of an incorrect lubricant because of temperature or contaminants; equipment fatigue caused by vibration or periodic cycles in temperature or pressure, era- brittlement and loss of toughness in the reactor pressure vessels from neutron radiation. Unfortunately, the NRC's program of age- related research covers only about 25 percent of the major equipment important to plant safety and will not be completed until the mid-to late 1990s. Two components affected by aging are emergency diesel generators and check valves.

Emergency Diesel Generators

Emergency diesel generators provide electrical power to run a nuclear plant's safety systems. In the event of reactor shutdown and a loss of main electrical power, the diesel generators must start, achieve rated speed and voltage, and begin supplying power to the plant's safety systems in less than one minute.

Although there are more than 200 diesel generators in use as emergency power sources in US nuclear plants, the complexity of the diesel-generator system and the lack of standardization makes it difficult to use experience in one plant as a means of predicting failures due to

aging in a)ther in plant. From 1965 to 1984, there were over 2,000 reported failures of diesel generators, according to a review conducted for the NRC by Pacific Northwest Laboratory. About t half of the failures appeared to be related to some form of aging degradation. Analysis showed that as plant age increased, so did the percentage of diesel generator failures due to aging. The primary causes of aging failures in the diesel-generator system are vibration, inferior quality of components, adverse environment, and human error during maintenance.

Check Valves.

A check valve is designed to open and allow flow through a pipe in only one direction. When the flow stops or reverses direction, the check valve closes. Several hundred check valves are used in a typical nuclear plant,

Neither the regulators nor the nuclear industry fully understands the nature and effects of aging on nuclear power plants

in both the safety and plant operating systems. Failures of check valves have resulted in water hammer (a condition in which water rapidly fills a void in a pipe then goes slamming against the end), over pressurization of low pressure systems, and damage to other system components. These failures have been caused by severe degradation of hinge pins, hinge arms, discs, and disc nuts. Many have been attributed to tapping of flutter of the check valve discs: When the flow velocity through a check valve is insufficient to cause the disc to reach the fully open position, disc flutter and tapping can occur. The flutter may cause rapid wear of the hinge pin and tapping against the backstop can generate significant impact forces that may result in fatigue of the disc stud.

Even if the check valve is properly designed for normal flow conditions, changes in plant operation can result in rapid wear. In November 1985, for example, in San Onofre Unit 1 in southern California, a severe water hammer extensively damaged a portion of the feed water system because five check valves had failed. The disc stud/nut connection in these check valves had fractured because of repeated impact against the open stop. Although these valves had operated satisfactorily for several years at full power, 15 months prior to the water hammer, plant power had been reduced to 85 percent. This resulted in insufficient flow to keep the discs fully open, causing repeated impacts against the stop and eventual failure of the threaded connection.

Unfortunately, the procedures used to test check valves cannot always detect conditions that could lead to their failure. Some check valves cannot be tested while the plant is running because of the adverse effect the testing would have of plant operation And some can never be tested at the required conditions because of the design of the system in which they are used.

Because of weaknesses in periodic testing and the inability to ever test some check valves, utilities periodically disassemble and inspect them. While disassembly provides good information about the condition of a check valve, it has some drawbacks. Aside from the cost and worker radiation exposure, reassembly errors can go undetected in valves that cannot be tested for reverse leakage or cannot be tested under the full flow conditions required during an accident. The NRC research program is attempting to identify methods of determining check valve conditions that would not require disassembly.

One aspect of check valve performance that is not tested and that will become increasingly important as plants age is their ability to withstand the force of rapid closure. If the piping upstream of the valve fails, the flow in the system will reverse rapidly, slamming the check valve closed. If it has degraded because of corrosion, thermal or mechanical fatigue, or other aging effects, the impact of the disc on the seat could rupture the valve, allowing a continuous reverse flow through the valve It is doubtful that the capability of an aging check valve to withstand such a rapid closure could be demonstrated prior to licensing of a nuclear plant. Yet the NRC's aging research program apparently is not investigating the effects of aging on this aspect of check valve performance.

Why Aging is Important

Less than 15% of the nucler plants in the United State have been in operation for more than 20 years, and only 2 small demonstration plants have operated for about 30 years. (One of those, Yankee Rowe, was permanently closed in 1992.) Thus, the nuclear industry has very little experience with aging effects on plants that have operated for even half of their 40-year design life, much less years longer.

Robert D Pollard
The Nucleus Summer 1992
Union of Concerned Scientists

Research 'Report

What Rawatbhata Can Learn From Chernobyl Related Research?

A paper entitled *Female Reproductive Function in Areas Affected by Radiation after the Chernobyl Power Station Accident* By V.LKulakov and 14 others has been published in *Environmental Health Perspectives* (Vol.101 Supp.2 Pages 117-123 [1993]). The paper reports the results of a comprehensive survey of the effects of the radiation released from Chernobyl in 1986.The paper concentrates on evaluating pregnancy outcomes and health risk to women and the consequences of the accident on the health of the progeny. The study is restricted to two well denned areas: the Chechersky district of the Gomel region of Belorussia and the Polessky district of the Kiev region in the Ukraine. The results of this study are of special importance to us in India since they show remarkable similarity with the findings of the health survey carried out in the environs of Rajasthan Atomic Power Plant at Rawatbhata.

The Results:

The methodology of the survey involved extensive medical examinations and follow-up cases for up to five years after the accident. While records of almost 7,000 labour histories were examined, detailed medical examinations were carried out on 688 pregnant women and their babies. The studies were carried out for a period of eight years, three years prior to the accident and five years after the accident.

The most important difference between this study and the Rawatbhata health survey, concerns the fact that while Chernobyl was a catastrophic accident, with serious contamination of air, water, soil and food, There has been no known accident at the Rawatbhata site and the officials have always claimed that the contamination of the environment and the food chain is 'negligible' and well within internationally accepted limits.

Health of mothers, fetuses and children badly affected in regions around Chernobyl

Deformities four times higher than before the accident

Disease resistance decreased

There are many striking similarities in the results of both the studies: One, a sharp increase in the number of congenital deformities. In one of the districts covered by the study, there was a four-fold rise in congenital abnormalities. Contrast this with Rawatbhata where one sees a three fold increase in the number of congenital deformities in the population showed an increase by a factor of three as compared to a control population. And children bom after both the reactors started operations are more than are five times more at risk of being deformed.

Another common strand in the suffering of people tear Chernobyl and Rawatbhata is the reduction in immune response. While at Rawatbhata, this loss of the body's repair mechanisms was seen by a marked rise in chronic infections like tuberculosis, intractable skin, gastro-intestinal and respiratory problems, the same phenomenon has been directly seen at Chernobyl by measuring immunoglobins in the blood.

Kulakov and co-workers have done an extensive study and they find many other health problems with pregnant mothers, new born babies and children. They find that mothers during pregnancy were more prone to suffer from anemia, thyroid dysfunction, placental insufficiency and hypertension These diseases though not directly related to pregnancy, piny a very powerful role in determining the pregnancy outcome. More commonly known radiation related effects, like platelets aggregation surrounding blood cells were also observed.

One of the major benefits that researchers in India can derive from this paper is that it gives a very fine methodology that can be followed to determine the health effects of low-level radiation. In a future follow-up study in Rawatbhata it would also be good to perform biological dosimetry by counting dicentric chromosomes, and do radiation monitoring of air water, soil and food samples.

Sanghamitra

Testament of faith

Letters from Nuclear Protesters Awaiting Sentencing

GreetingB, Friends.

John Dear, Bruce Friendrich, Phil Berrigan and I acted December 7, 1993 to expose and disarm one weapon of U.S. nuclearism, an F-15E fighter bomber, in readiness at Seymour Johnson Air force Base, north Carolina. Three of us, acting on strong religious beliefs, and I, with strong secular spiritual belief, poured blood and hammered on this bomber to speak truth through action, and to resist militarism and oppression. We acted to concretely disarm a plane which was already used to slaughter Iraqis and which will likely bo used again to slaughter Koreans, or Bosnians (Serbians, Muslims and Croatians alike). We acted to help stop the warmaking madness; to alert and educate the people of North Carolina to their economic dependence on oppression and murder. We acted because our consciences required us to act (in the loving tradition of thousands before us)...

As I awaited this trial separated from my acting community as the only woman among us, I spent long hours considering war, oppression, exploitation, imperialism and death, as well as peace, nonviolence, resistance, economic justice and love. I'll offer just a couple of my very basic conclusions: if you value life, you do not build trillion dollar arsenals for the sole purpose of eliminating it. If you respect life, you do not allow those trillions of dollars of resource to be stolen from the sick, the poor, the dispossessed and our children. If you love life, you do not allow anyone, any power, to do these things in your name.

It is true I have mourned the precious moments, days, months, years stolen from all who are prisoners-for political, economic or psychological reasons, yet, I understand that my freedom is a very small sacrifice when millions throughout the world suffer the torture of our national collective inaction. And, i rejoice- because the action and incarceration of only four have already served to inform, motivate and encourage hundreds more, who will then inform, motivate and encourage hundreds more... to more serious resistance and justice, to greater commitment to concrete, status-quo shattering, creative social change.

Lynn Fredriksson

Dear Sisters and Brothers

...Recently, I read something that helped explain the frightful proliferation of violence in the U.S.-the multiplication of guns, shootings in the schools, more and more suicides, rapes and abuse of children, something seems to be driving us mad, as though we have decided to tear one another apart, decided that everyone is an enemy to be killed. What's behind all this savagery? Is it possible to identify the source?

Perhaps we can consider this. It is a fact that during and after the Vietnam War, American homicides jumped 42%. Isn't this the price we pay for killing millions of Indochinese? More to the point, isn't it inevitable that when the U.S. butchers people abroad, we kill one another at home? Is this the key to the bloodshed on our streets?

Yes on all counts, I would Bay. the government represents us; we pay for it and hold it; it acts for us collectively, when it destroys moral barriers in our name by carpet bombing of Hiroshima and Nagasaki, by leading the nuclear doomsday race, by repeated interventionary war, by wars as our #1 business, these same moral barriers will plunge in our people. If the government cheapens life and attacks it ~ the people will also. We will begin to kill one another with a dreadful compulsion.

We must understand that this government will never admit to criminality, Hazel O'Leary notwithstanding, this government will never disarm its nuclear warheads or demobilize its military. This government will never take responsibility for carnage on our streets. Because this government is irresponsibility, injustice and cruelty.

So much for Washington. As for us, we must be responsible, and nonviolent resistance is the ultimate responsibility.

Resistance is to the American killing machine and its white collar killers. Resistance is to a criminal, insane government and to its killings.

Resistance is the best protection for ourselves, our children, our communities and our people.

In God's name then, and in our own, let us resist the killers and stop their killing.

Philip Berrigan
The. Nudear Resister
March 25, 1994

Whitewash in France

An "Independent" Inquiry Commission Submits a Blinkered Report

On the 22th of February 1994, the French government authorized the restart of the fast breeder nuclear reactor Superphenix (1200 MW) after three and half years of stand-by for safety reasons. This restart was refused in June 1992 because the safety of the installation was not "assured". Although the situation has not changed one bit since then, the pressure from the nuclear lobby overran all concerns regarding the safety of the population, or concern for democratic procedures.

From March to June 1993, a Public Commission of Inquiry investigated the possibility of restarting the reactor. This was demanded by the operating company, NERSA, in October 1992. The Commission published a report which was made public on September 30th, 1993.

The public was allowed to present evidence to the commission and this was largely done. The Commission received 29,412 depositions. Of these, 96% were opposed to the restart of the reactor. The "commissioners" declared that they had no competence on the subject of nuclear technology, but instead of examining the evidence, they asked the NERSA company itself to write the technical aspects of the report. The Commission totally ignored the opposition from various sources including elected representatives, independent technicians, local residents, etc The report does not even give the opinions of the Minister of Environment, national and official institutions like the Social & Economical Council and the Nuclear Information & Safety Superior Council. The Commission has thus fully collaborated with the nuclear lobby to bring out a report which protected its interests.

Mr. Pronost, a member of the Commission, was invited to visit nuclear reactors in Russia and Japan. His visit in Russia gave him "a good impression" and he reported that the fast breeder at Beloyarsk (BN 600 MW) is "in a good state", and that "Russian technicians monitor fully the technics of this kind of reactor". However in fact, in the beginning of 1991, 600 kg of sodium caught fire and three days were needed to put it out, and the fire resulted in a collective irradiation dose of about 200 man-rem. In Japan, he met only nuclear technicians and, therefore according to him "there is no ecological opposition in Japan". Which is patently false, since Japan has a strong and growing antinuclear movement which has organised large national meetings against the fast breeder reactor of Monju (280 MW) in October 1993.

The Commission said that it was not competent to decide on questions of economics, technical problems and safety questions. One wonders what was within its competence?! Moreover, the questions concerning economics, laws, energy choices, nuclear wastes and nuclear in general "were not within the frame of "terms of reference" of the inquiry". Of course, the numerous accidents and incidents at the site since the reactor started in 1986 were not within the frame of its competence ! For the Commission, Superphenix was "the best energy producing machine in the world". It would all be hilariously funny if several millions people ware not within the range of possible irradiation in case of a serious accident.

In December 1993, a meeting of the Parliamentary Office for Scientific & Technical Choices was organised to inform the members of the Parliament regarding the question of restarting the Superphenix nuclear reactor at Creye-Malville. But strangely, no parliamentary debate has ever been conducted regarding the original starting of the reactor since the project was planned in 1976.

Currently some of the unresolved outstanding problems of safety are :

- No safety evaluation of the reactor under actual operating conditions exists.
- The fact that under accident conditions the reactor core can rearrange itself and the heart of the reactor can explode like a nuclear bomb.
- The difficulties regarding use of sodium; and controlling fires of sodium
- Difficulties of intervention inside the containment.
- The operators are not regulated properly and have in the past taken too long to analyze unusual incidents and accidents which have occurred frequently.
- Superphenix produces wastes for millions of years, which we do not know what to do with.
- Superphenix produces weapon's grade plutonium (several hundreds of kilograms since it started in 1986), which contributes to the proliferation of nuclear weapons.

We have fought a long, seemingly never-ending campaign against the new reprocessing plant THORP, the startup of which, although built, we managed to delay for nearly 2 years. We did everything possible, rallied international support, took the Government to court, but ultimately had to accept that big money speaks louder than common sense or concern for the health of the population and that there is no justice.

I often think about the Berlin Global Radiation Victims Conference, meeting you and it seems a lifetime away. Hearing all those testimonies and evidence then and hoping that something dramatic would come of it and looking around what is happening in Britain now, the way the nuclear industry is managing worldwide to steer research away from radiation biology and relying on epidemiological studies to prove that all our problems are caused by viruses and the racing about of workers all over the place is really quite frightening.

I get so angry when I see all this dishonesty, eminent scientists who seem to get 'bought[1] by large amounts of cash being poured into their departments to produce the 'right' results and in contrast others who seem to be doing exciting research into the effects of low-level radiation, being starved of funding.

No doubt, you are aware that we have lost the leukemia court cases which were based on the Martin Gardner theory, due to lack of supportive evidence. This has now been a sign for the nuclear Industry to claim that radiation has nothing to do with ill-health.

I read *your AnumukH* Journal with great interest and hope to use information from the special issue on Rawatbhata in our next 'Waste Paper', we've got to keep pushing the message and tell what is happening. I am enclosing some of our 'Waste papers' which are published quarterly and well put you on our mailing list for future issues.

Janine Allis-Smith
Cumbria

The visit of the AERB chief to Vedchhi is indicative that our long struggle for justice for the people of Rawatbhata is finally beginning to yield some fruitful result. The government has to recognise people's yearnings and I am sure that the future would bring brighter results.

Dr. Rampratap Gupta
Rampura

What Mutual Understanding is proposed to be built? That anti-nuke is right and pro nuke is also right? Where is the gray area where black and white come together? If you have any issues that could be included in such a gray area I would be pleased to know them.

Earlier we had people of the stature of the much respected Dr. Vikram Sarabhai, the second chairman of India's Atomic Energy Commission. He was a concerned scientist who could contain political bosses from giving directions to his department. The offer of a dialogue by Dr. A. Gopalakrishnan chairmen AERB, makes me apprehensive.

- Will the dialogue be open? Will it be fully reported in newspapers?

- What aboufclasaified information* under which everything that *"hurts'* is hidden?

- Has he the freedom to "blow the whistle?" If not how far will he go to lose his job?

- What are the guarantees against misusing our opinions and berating us as misinformed and misguided?

Allow me to quote Gandhi. In March 1922 he told judge Broomfield:

"1 am here therefore to invite and submit to the highest penalty that can be inflicted upon me for what in law is a deliberate crime and what appears to me to be the highest duty of a citizen. The only course open to you, the judge, is either to resign your post and thus disassociate yourself from evil, if you feel that the law you are called upon to administer is an evil and that in reality I am innocent, or to inflict on me the severest penalty, if you believe the system and the laws you are assisting to administer are good for the people of this country, and my activity is therefore injurious to public weal.[9]

Dr. A.Gopalakrishnan is a man with a family and friends and I am sure he wishes well for them. Will he be ready to say that these dear and near ones need not ever fear radiation from nuclear plants? Would he like any of them to handle the things that are being handled at the plants by casual labour? Or else will he be prepared to resign and joins the anti nuclear group?

May be you would not be "coopted", but what guarantee is there that you could not be used or misrepresented?

In spite of all that is said above, if you feel confident that there is some possibility of opening the door, I wish you God speed.

Shri Jyotibhai Desai
Vedchhi

I was glad to note that Dr. A. Gopalakrishnan came to you on fas

own for a long discussion. It proves, (I do not think you need such proofs, no Gandhian does) that there are people on both sides of any fence who do not entirely belong there and are willing to discuss issues. One's background and sources of knowledge can always differ.

Dr. Pramod Moharir
Hydrabad

Why does Anumukti not publish research articles? I am in the process of writing a review article on human chromosome anomalies and aberrations due to damage caused by radiation and drugs. I am also trying to do genotoxicity teat of some chemicals on fishes through sister chromatid differentiation.

Dr. Ashok Barat
Allahbad

The reason Anumukti does not publish unadulterated research articles is because "genotoxicity due to sister chromatid differentiation" is Greek for most of us including the editor. However, we would gladly publish articles which have been written with the lay public in mind.

I got your address from your article in *Sunday Observer.* It was terrifying to read about the awful state of nuclear power stations in India. Just to ape the West, we are not only ruining our culture and heritage but our life as well. Nuclear stations are a franckenstein monster and any catastrophe could lead to another Chernobyl

Dr. Amit
Jhansi

It must be some kind of a record (Guineas Book, please note) to have three issues *of Anumukti* coming out in the span of less than one month. The February/March issue did come out in March and so it seems that you have finally managed to beat the clock. Congratulations. I was happy to read about Dr. Gopalkrishnan's visit. I would like to know more about what you talked with him. I feel it is a new opening and if talks like this continue to take place, it would be in the long term national interest. If there could be a platform from where both sides could place their Arguments as happened in Bangalore '88, that would be an important step forward.

Vinayak Dave
Gandhinagar

The pronudear side took such a beating in Bangalore, that they have for-
sworn any repetition. The antinukes are always prepared to meet the nukes for an open public debate any time any place.

Since you have asked for suggestions. I am taking the liberty to pen my thought. It may not be possible to incorporate everything that I say, but the points do require your attention.

- Please give small snippets which Are interesting, informative and appealing along with long articles.
- Opinions of well known scholars in support of the articles should also be presented.
- References to the facts and figures used in articles would be very useful.
- A cost-benefit analysis of big projects against small ones should be given.

Chandmalji Kanstva
Gandhinagar

RAPP (Rajasthan Atomic Power Plant) authorities had organised an ofT-site emergency preparedness drill on December 22nd, 1993. We had organised a protest for the occasion and reiterated our demand for a referral hospital at Rawatbhata The local administration gave us good support and even the Rajasthan state government put pressure on RAPP authorities. RAPP authorities have finally conceded our demand and given a building to host the referral hospital which will be run by the state government. There will be six doctors And 30 beds. The hospital has already begun functioning and these is some relief to the poor. In support for our demand we did cite the case of Kakrapar, where the nuclear authorities have fnven money to local educational and medical facilities, but it had fallen on deaf ears without pressure from tho public. The RAPP administration still continues in its effoits to hinder useful social work by instigating some greedy local people.

Hatanlal Gupta
Rawatbhata

I had been busy with the anti-Dunkal campaign in Delhi and hence could not write to you earlier. What has been the response from Rawatbhata? Only A few people would be influenced by the RAPP Authorities' public relation campaigns. If the work of awareness raising and organisation work continues unabated then people would realise their hitherto hidden united strength and greater pressure would he put on RAPP authorities, feel that in talks with Dr. Gopalak rishnan, A few local residents from Rawatbhata should remain present and at least some portion of the talks should take place in Hindi or arrangements should be made regarding simultaneous translations. I also feel further surveys should be conducted in the neighbourhood of Rawatbhata and the true position regarding health should be firmly established. We would like to be part of this survey team.

Sunil
Kesla

A Ray off Hope From Pakistan

Just before going to the press we received this letter from Dr. Zia Mian in Islamabad. I was thrilled with it, since it is the first time in many years of effort that we have received a communication from across the border which expresses the hopes of all peace loving people of the subcontinent lam sure that there are many who would love to reciprocate the sentiments expressed in this letter and I would urge them\o do so, not only in Anumukti but also in mainstream press. Dr. Zia Mian sent cuttings of five articles of his which added to my astonishment It was a revelation for me to realise that contrary to my impression the mainstream press in Pakistan is 'free'. I have yet to see such a forthright condemnation of the nuclear madness in any of the large newspapers in India. Due to lack of space we are not republishing a full article in this issue but we have an exerpts on page .

Dear Friend,

I am writing to you as part of an attempt to establish a dialogue on peace in South Asia. I am currently researching and writing on peace and security in South Asia as a visiting fellow at the Sustainable Development Policy Institute, in Islamabad. I also write a column in The News, a major English Language paper published in Islamabad, Lahore, and Karachi. I hope that after this letter you will wish to open up a line of communication between your organisation and 8DPI, as part of our contribution to this dialogue. Let me explain the motivation.

I believe that there are sizable minorities in India and Pakistan for whom the nuclear arms race between our countries is a symptom of a deeper malaise. It is this that needs to be tackled, but the issue of nuclear disarmament in the region can, in fact, help us address this. The important thing is for groups in India and Pakistan to make common demands, but to make them to their respective states, and to couch them in unilateral terms. For example, Pakistani groups should demand that their government give up the nuclear weapons programme, and be able to point to Indian groups that are making the same demand of their government. But both sets of groups should not accept a position that we will give up our programme, if you give up yours". It is these demands that need to be worked on together.

For me a crucial problem is the absence of information about the peace movement in India. Since I know how difficult it is to follow the debate on this issue in India, from Pakistan, and I presume it is almost as difficult for you to get access to the Pakistani media, I enclose a copy of some of my articles that have appeared in the press in Pakistan. I would be grateful for any material you may be able to send me.

Dr. Zia Mian
Sustainable Development Policy Institute
P.O.Box2342
Islamabad, Pakistan

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Sampoorna Kranti Vidyalaya
Vedchhi 394 641 India
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Anumukti Team:

Banaprava Naik, Somesh Chandran, Sanghamitra and Surendra Gadekar

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