

# FACTS *against* MYTHS

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INFORMATION BULLETIN

## No Clear Reasons : *The Myths of Nuclear Power - II*

### COMMENT

The history of nuclear power begins in the Second World War with the West (particularly the US and UK) racing to produce a nuclear bomb before Hitler's Nazi Germany. In 1945 the first atomic bomb, 'Trinity', was exploded in New Mexico on July 16, 1945. The following month the US used its new nuclear weapons for the first time against people — at Hiroshima and Nagasaki. The Hiroshima bomb was a uranium bomb while that dropped on Nagasaki was a plutonium one.

Bomb manufacture begins in the nuclear plant which produces energy in much the same way as a coal power plant: heat is produced which boils water which produces steam. This steam passes through turbines and these in turn drive generators which produce electricity. The difference is that in a nuclear power plant the heat is produced in a nuclear reactor, the fuel used is uranium.

The atom bombs can be manufactured with either uranium 235 or plutonium 239, the former is a man-made element not present in nature. Plutonium is a waste product generated during the operation of a nuclear power plant. Weapon countries have laid emphasis on 'civilian' nuclear power to meet their demand for plutonium, which is separated from the waste, also known as spent fuel. This is an extremely hazardous process, both for the workers and the general environment.

The real motive for reprocessing nuclear waste? There is only one for it: to produce plutonium for nuclear weapons. Yet, this is denied by the nuclear

establishment, and with good reason. To use civil nuclear waste to produce plutonium for military purposes (i.e. bombs) is illegal.

Over and above these, doubts about the safety of the nuclear industry has risen sharply especially since the Chernobyl horror.

The crucial conclusion to be drawn from the above is that nuclear power and nuclear weapons are, in the nature of things, inseparable. It is no longer valid to hold on to the schizophrenic stand of being "pro-nuclear power, but anti-nuclear weapons". And *vice-versa*. Thus, a strategy for nuclear disarmament today — apart from the need to de-nuclearise the mind — also entails the abandonment of nuclear power, for the

maintenance of 'peaceful' facilities would constitute a standing invitation to reopen the military option! In the meantime it is also essential to dispell some of the

**HELP FIGHT CANCER  
STOP  
NUCLEAR POWER**

major myths on nuclear power.

**MYTH :** *Nuclear Power plants are safe and reliable, designed and built to automatically shut off if and when they fail and the public would suffer no harmful exposure.*

**FACT :** India has 9 operating nuclear power plants with a total installed capacity of 1720 MWE. Performance-wise, however, they are extremely poor i.e. they are not totally safe. According to Dhirendra Sharma<sup>2</sup>, there have been estimated 300 incidents of a serious nature causing radiation leaks and physical damage to workers. Between 1992-93 over 147 "unusual occurrences" were experienced at various atomic sites. This has been confirmed by the spate of failures, viz.,

❖ September 1989 : the Rawatbata power plant near Kota in Rajasthan suffered a leak;

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- ❖ In 1991 UNI reported 4 deaths at the Nuclear Fuel complex (Hyderabad) and 5 more deaths in 1992;
- ❖ January 24, 1992 : the Rajasthan Atomic Power Station (RAPs, Unit 1) ruptured and 4 tonnes of Heavy Water was released. In August the same year decontamination was carried out of the whole project and in the process an undisclosed number of contract workers were exposed to high doses of radiation. In March 4, 1981 the Unit was damaged and had to be shut down. Over 2,000 workers were exposed to excess radiation and 300 had to be hospitalized. Ultimately, RAPS I was refurbished and started operations in 1997 after operating sporadically for over a decade. But the shadow of inefficiency and risk still hangs heavy over this unit,
- ❖ May 1992 : the effluent plant at Trombay (Mumbai) was contaminated owing to leakage of liquid waste from an underground pipe;
- ❖ May 13, 1992 : Unit 2 of the Tarapur Atomic Power Station, a serious accident had occurred resulting in 11.94 curies of radio-activity escaping into the environment. The plant had to be shut down. Some years earlier, there had been more serious accidents. At least three people died in the inner chamber with over 3000 workers exposed to non-permissible doses of radiation;
- ❖ May 15, 1992: the Heavy Water Plant (THAL) was gutted by a fire in its "A" stream. 7 contract workers were injured and 2 seriously. Information about the injuries were suppressed. The plant was shut down for over a month;
- ❖ September 16, 1992 : the Nuclear Fuel Complex (Hyderabad) had an explosion in which 3 workers suffered burns. A similar accident took place at the Madras Atomic Power Station (Unit I) at Kalpakkam in July 1984, soon after its was commissioned;
- ❖ October 29, 1992 : H<sub>2</sub>S leaked from the Manugura Heavy Water Plant and the Scientific Assistant (B), K. V. Prasad got exposed to the lead resulting in his death;
- ❖ March 19, 1993 : a serious fire in the turbine hall the Narora Atomic Power Station (NAPS, Unit I) occurred with both its Units suffering from radiation leaks;
- ❖ May 13, 1994 : the concrete containment dome structure weighing around 130 metric tonnes at the Kaiga Nuclear Plant collapsed. Concrete slabs weighing thousands of tonnes crashed from a height of 40 meters. The death toll remains a secret. From the public safety angle, the dome of atomic reactors serves as a check against radiation leaks, absorb powerful shocks e.g. earthquakes, and withstand missile bombardments and internal high pressure;

- ❖ In 1996 the storage tanks with radioactive waste from the Cirus and Dhruva reactors at Trombay (Mumbai) developed leaks.

To conclude, it is no longer sufficient to parrot this myth, 'Nuclear reactors cannot blow up' (like a bomb)' or that they are built to automatically shut-off if they fail. Just because India has not had a Chernobyl-type of a disaster is no reason at all why there will never be one. Questions of nuclear accident cannot be dismissed by issuing simplistic and frivolous arguments.

**MYTH : The global energy crisis with the ever-rising demand for power makes nuclear energy the only logical and enevitable alternative to a) bridge the energy gap and b) serve development purposes.**

**FACT :** First and foremost, there is nothing 'logical' to opt for nuclear power. It was and is a deliberate and well thought out choice dictated more by factors such as "international prestige", the possibility of enrollment into the elite Nuclear Club, the personal clout of nuclearcrats like Bhaba, among few others, and the gain of one-upmanship of our perceived enemies. So, nuclear energy is part of a conventional approach to energy planning that ironically is rapidly becoming obsolete.<sup>3</sup> Nonetheless, in this approach energy is treated as an end in itself and the focus is on increasing energy consumption. The main obsession is to make projections of energy demand into the future, invariably using simplistic extrapolations of past and present trends. Business, they believe or hope, will continue as usual. Such projections often forecast large gaps between demand and supply. Thus, the pertinent point in this approach is how to maximise energy supplies so as to bridge the demand-supply gaps. And in this search for supplies, nuclear power, which comes in large reactor-size blocs, claims a justification.

However, what is required, instead, is *not* energy *per se*. Energy by itself is meaningless in human society. It is the transformation of energy into work that has meaning. This is true in all cases whether one considers burning wood to make *dal-chawal* (for which women have to trudge for miles) or using electricity, derived from atomic reactors, to light up a Pepsi hoarding. This is the true indicator of development — not the magnitude of energy used. It is the level of services provided by energy that determines the quality of life and the extent to which basic needs (e.g. employment) are being met.

Furthermore, the amount that nuclear power provides towards our total energy needs is negligible, merely 2.4 per cent as on March 31, 1996. Even in the UK the amount is merely 2% (20% to 10%) which means that 98% comes from other sources.

Finally, the Ministry of Non-Conventional Energy Sources had identified around 40 such sources viz., solar, wind and tidal power. It is also promoting small hydro-projects of up to three m.w. in the 9<sup>th</sup> plan. Even in electricity, a 2% improvement in efficiency of usage



or reduction in losses can make nuclear energy unnecessary. With 85% of the energy budget going down the nuclear drain, such genuinely environmentally friendly and sustainable approaches to development continue to be ignored.

**MYTH:** *The so-called alternative energy sources e.g. solar or tidal power, biomass, etc., are impractical and limited in terms of usefulness. Their relevance is marginal, at best.*

**FACT:** This is merely propaganda by the nuclear establishment and vested interests to discredit alternative energy paths as these are seen as a threat to their goal of pushing ahead with nuclear power. That is, the plans to develop and expand nuclear power sources would be in jeopardy if benign renewable and sustainable sources would be adopted as viable alternatives being considered more and more today due to increasing hazards of nuclear power. Little wonder, therefore, the nuclear lobby seek ways and means to shoot down any such endeavors as the following is an illustration. (See box above)

The obstacles put in the way of the Duck and other alternative energy sources by the nuclear lobby are common and come up with contrived conclusions, namely, that alternative energy innovations are "unlikely to show any significant cost reductions..." etc.

**MYTH:** *The fear of nuclear radiation in small doses is baseless. After all, there is more to radiation from background sources than from nuclear power plants.*

**FACT:** This is now a well-established disinformation campaign by nuclearcrats to mislead the public. However, nuclear power plants pollute the environment by releasing radioactivity. This is *biological* form of pollution and should not be compared with *chemical* pollutants produced by other plants.<sup>4</sup> Radiation is invisible but it can pollute our lives with effects far more devastating than any chemical pollutant. The background radiation present around us is quite different in nature and effect. It cannot be compared with the radioactivity released by nuclear power plants. It is, no doubt true that 50% of the estimated exposure to radiation is from background sources. It is also true that any radiation we receive is

In 1976, U.K.'s Department of Energy (DEN) had believed that wave power was the most attractive among the various available alternative choices particularly wind power. Therefore the nuclear industry in its interest boosted wind power as "a winner" (though not too strongly or it might itself boomerang on them if it became the alternative to nuclear power) and discredit wave power. They eventually succeeded in their objective and in 1982 and wind power research was established as the top priority renewal. Many wave power devices suffered as a result.<sup>5</sup> For instance, the wave power device known as the 'Salter's Duck' developed by Prof. S. Salter of Edinburgh University. The device is a canister which bobs up and down on the wave like a floating duck, the resulting motion driving an electrical generator. It received a highly appreciative response along with other wave energy devices by DEN which gave it the go-ahead for its development. But the pro-nuclear lobby were dismayed and went on an overdrive to oppose the move. In a secret report it persuaded a DEN's concerned department that wind power had more immediate possibilities of being economic than wave power, and that the required reduction of the renewal research budget would therefore have to be met by shutting down wave power research.

In the meantime, Gordon Senior was appointed with special responsibility for the Ducks whose many conclusions were totally reversed. Senior took up the matter to the House of Lords Committee and complained that his key conclusions were both changed and even reversed.

Under the facade of making a comparative analysis of the capital costs of various alternative energy sources, the method of calculating the same for the Duck was manipulated by the pro-nuclear lobby. Prof. Salter was never allowed to intervene to challenge these manipulations with his innovation.

harmful and increased amounts increase the harm. A careful balance has evolved through the ages between natural background radiation and human cells. Exposure to radiation is part of the aging process of all living cells. If that exposure increases, the aging process accelerates. Cells can be damaged, and if a damaged cell is in the reproductive organs, mutations occur too. For women especially exposure to radiation is of particular significance. First of all, women bear the fetus which is so highly sensitive to radiation. It is known that the most damaging period is between day 10 and day 41, or what is called organogenesis. To have a medical x-ray each year during this period would be the most damaging. During the rest of the 299 days of pregnancy, the risk to a fetus still remains high — 200 times greater than to a man in his 50s. This leaves quite a burden on the mother to try to protect her unborn child. Even before a woman is pregnant, radiation can affect her future offspring.<sup>6</sup> Since the eggs within the ovaries of a woman are formed at birth and do not change until she reaches menopause, exposure to radiation during that 40-50 year period can damage the eggs before fertilization. With men, the sperm continually reproduce and sperm damaged by radiation are rapidly replaced by healthy sperm.



**MYTH : Nuclear radiation is safe within permissible limits.**

**FACT :** First, there is no such phenomena as 'safe' threshold below which radiation is considered absolutely harmless. Every atom has the potential to kill. In the wake of the Chernobyl catastrophe studies on the long-term effects of even low radiation on human health are showing disturbing results on health and the environment. But low level radiation, high level coverups are the order of the day of nuclear industries the world over. Radiation in any quantity takes its price. Again, reports and studies reveal massive radiation damage around all our nuclear installations, whether it is Juduguda in Bihar, Alwaye in Kerala, Rawabhata in Rajasthan or Cherlapally in Andhra. Widespread incidence of cancer, leukemia, thyroid disorder sterility, infertility, distorted children with genetic deformities — the list is long and technical. Evidence from Tapru, Kerala and uranium mining sites have been enough to demonstrate '*prima facie*' the harm

of radiation engendered by the nuclear fuel cycle. Animals and plants are also susceptible to radiation. Even the smallest dose of ionising radiation caused genetic defects. According to experiments that included doses down to 0.1 rem (1 msv) per day on mice proved this point. All genetic defects from X-rays or gamma rays were cumulative either additive or proportional to total dose. Even when the dose rates were lowered, genetic effects were additive. Citing Dr. Sanghamitra Gadekar of the International Medical Commission on Chernobyl, Humanscape magazine (July 1998) reported that there have been an increase of stillbirths, miscarriages and death of one-day-old children near the Rajasthan Atomic Power Project. These have not been attributed to infections but have to do with deformities or other birth defects. There have been 40-50 deformities per 1000 births in the region. These deformities also appear in animals. Solid tumours were seven times as high in the proximate villages compared to the distant villages.

Above all, there are now some indications that low-levels of radiation, below the so-called permissible dose, may be even more harmful than higher doses.<sup>6</sup> With high doses, cells are killed. With lower dose, cells are damaged and cause havoc to the body for years to come. Way back in 1978 a report of the US National Academy of Sciences had stated, "Women face a greater risk because they, almost exclusively, are susceptible to breast cancer and are more likely than men to develop cancer of the thyroid". The report also states that "one

rad given in one year over the whole body, to one million people will produce 182 to 756 cases of cancer in males, or 344 to 1306 cases of cancer in females". There are many tragedies implicit in all of these grim facts. The related myth that the social benefits of x-rays, radiation therapy, and nuclear energy outweigh the "possible" health risks they might bring about. No one, has yet attempted to convince the world that the dropping of atomic bombs fits into the same category of "social benefits". A similar attitude prevails, however, with the medical, utility and military professionals, viz., paternalism. The general public is kept uninformed and overexposed. Nature's delicate balance between cells development and radiation damage is being tinkered with, all in the name of "social benefits".

The so-called acceptable or "permissible limits" level is thus a highly bizarre definition of safety rooted in the same nuclear mentality. In this case, a mind-frame of risk-benefit tradeoffs. Those who introduce

regulations have decided that the setting of regulation is not a public health function. So, regulations are not set so as to protect public health or the welfare of future generations. That is the trade-off underlying the regulation. The regulation is meant to be a political statement that people accept the cost in

life, health and damage to future generations in exchange for the benefit of the activity. The benefits are economic and social. You have here a pseudo-science.<sup>7</sup>

**MYTH : Nuclear waste management is not a serious threat as it can be neutralised or made harmless and can easily be stored in an area as small as a football field.**

**FACT :** Even theoretically this is impossible. Radiation is a different form of pollution and radioactive waste cannot be compared with any kind of industrial waste. This fact is fully exploited by nuclearcrats who compare the two dissimilar materials to their own advantage. For instance, it is possible to neutralise toxic wastes chemically, but this is not so with nuclear waste. No matter how, for instance, a bottle of radioactive milk is boiled or pasteurized, it will never ever be fit for human consumption. The only solution is to bury it underground in a concrete container and hope for the best. Yet, there is need for immense caution. Some years ago, the Americans thought that the deep salt beds at Calsbad, New Mexico, would be geologically stable enough for



HEAR NO RADIATION. SEE NO RADIATION.  
TASTE NO RADIATION & STILL IT CAN KILL YOU



## Document : The Russell-Einstein Manifesto

In the tragic situation which confronts humanity, we feel that scientists should assemble in conference to appraise the perils that have arisen as a result of the development of weapons of mass destruction, and to discuss a resolution in the spirit of the appended draft.

We are speaking on this occasion, not as members of this or that nation, continent, or creed, but as human beings, members of the species Man, whose continued existence is in doubt. The world is full of conflicts; and, over-shadowing all minor conflicts, the titanic struggle between Communism and anti-Communism.

Almost everybody who is politically conscious has strong feelings about one or more of these issues; but we want you, if you can, to set aside such feelings and consider yourselves only as members of a biological species which has had a remarkable history, and whose disappearance none of us can desire.

We shall try to say no single word which should appeal to one group rather than to another. All, equally, are in peril, and, if the peril is understood, there is hope that they may collectively avert it.

We have to learn to think in a new way. We have to learn to ask ourselves, not what steps can be taken to give military victory to whatever group we prefer, for there no longer are such steps; the question we have to ask ourselves is : what steps can be taken to prevent a military contest of which the issue must be disastrous to all parties?

The general public, and even many men in positions of authority, have not realized what would be involved in a war with nuclear bombs. The general public still thinks in terms of the obliteration of cities. It is understood that the new bombs are more powerful than the old, and that, while an A-bomb could obliterate Hiroshima, one H-bomb could obliterate the largest cities, such as London, New York, and Moscow.

No doubt in an H-bomb war great cities would be obliterated. But this is one of the minor disasters that would have to be faced. If everybody in London, New York, and Moscow were exterminated, the world might, in the course of a few centuries, recover from the blow. But we now know, especially since the Bikini test, that nuclear bombs can gradually spread destruction over a very much wider area than had been supposed.

It is stated on very good authority that a bomb can now be manufactured which will be 2,500 times as powerful as that which destroyed Hiroshima. Such a bomb, if exploded near the ground or under water, sends radio-active particles into the upper air. They sink gradually and reach the surface of the earth in the form of a deadly dust or rain. It was this dust which infected the Japanese fishermen and their catch of fish.

No one knows how widely such lethal radio-active particles might be diffused, but the best authorities are unanimous in saying that a war with H-bombs might possibly put an end to the human race. It is feared that if many H-bombs are used there will be universal death – sudden only for a minority, but for the majority a slow torture of disease and disintegration.

Many warnings have been uttered by eminent men of science and by authorities in military strategy. None of them will say that the worst results are certain. What they do say is that these results are possible, and no one can be sure that they will not be realized. We have not yet found that the views of experts on this question depend in any degree upon their politics or prejudices. They depend only, so far as our researches have revealed, upon the extent of the particular expert's knowledge. We have found that the men who know most are the most gloomy. Here, then, is the problem which we present to you, stark and dreadful and inescapable : Shall we put an end to the human race; or shall mankind renounce war? People will not face this alternative because it is so difficult to abolish war.



The abolition of war will demand distasteful limitations of national sovereignty. But what perhaps impedes understanding of the situation more than anything else is that the term "mankind" feels vague and abstract. People scarcely realise in imagination that the danger is to themselves and their children and their grandchildren, and not only to a dimly apprehended humanity. They can scarcely bring themselves to grasp that they, individually, and those whom they love are in imminent danger of perishing agonizingly. And so they hope that perhaps war may be allowed to continue provided modern weapons are prohibited.

This hope is illusory. Whatever agreements not to use H-bombs had been reached in time of peace, they would no longer be considered binding in time of war, and both sides would set to work to manufacture H-bombs as soon as war broke out, for, if one side manufactured the bombs and the other did not, the side that manufactured them would inevitably be victorious.

Although an agreement to renounce nuclear weapons as part of a general reduction of armaments would not afford an ultimate solution, it would serve certain important purposes. First : any agreement between East and West is to the good in so far as it tends to diminish tension. Second : the abolition of thermo-nuclear weapons, if each side believed that the other had carried it out sincerely, would lessen the fear of a sudden attack in the style of Pearl Harbour, which at present keeps both sides in a state of nervous apprehension. We should, therefore, welcome such an agreement, though only as a first step.

Most of us are not neutral in feeling, but, as human being, we have to remember that, if the issues between East and West are to be decided in any manner that can give any possible satisfaction to anybody, whether Communist or anti-Communist, whether Asian or European or American, whether White or Black then these issues must not be decided by war. We should wish this to be understood, both in the East and in the West.

There lies before us, if we choose, continual progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings : Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death.

#### Resolution

We invite this Congress, and through it the scientists of the world and the general public, to subscribe to the following resolution:

"In view of the fact that in any future world war nuclear weapons will certainly be employed, and that such weapons threaten the continued existence of mankind, we urge the Governments of the world to realize, and to acknowledge publicly, that their purpose cannot be furthered by a world war, and we urge them, consequently, to find peaceful means for the settlement of all matters of dispute between them".

*Max Born, Linus Pauling, Percy W. Bridgman, Cecil F. Powell, Albert Einstein, Joseph Rotblat, Leopold Infeld, Bertrand Russell, Frederic Joliot-Curie, Hideki Yukawa, Herman J. Muller (Issued in London, July 9th, 1955)*

radioactive waste disposal. Attempts had also been made to make a facility at Hanford, Washington which would be a permanent burial site for radioactive waste. In both cases, uncertainties about underground water movement made the sites geologically unstable.

Every year our reactors generate some of the deadliest waste ever generated by man. Finding a final resting place for it is a problem that continues to baffle scientists ever since it started piling up in the 40s.

Interim storage, as implied in the myth, is a convenient ploy of the nuclear industry of passing the buck. For generations and generations to come, all have to learn to live with them. It is a burden that humanity has to carry for thousands of years.

Clearly, the problem of waste resulting from nuclear development is not simply the physical problem of accumulating radioactive garbage. It is a social problem of the misallocation of precious resources according to



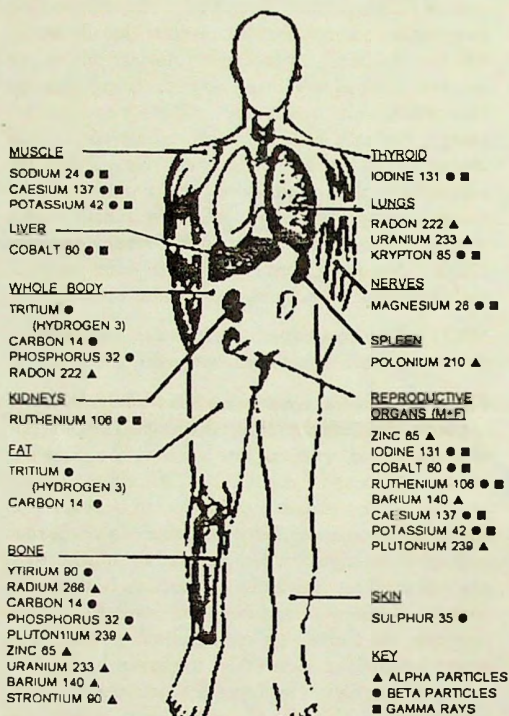
the logic of capitalism. Not the least of such misallocation is the waste of human energy and the devaluation of life itself. Thus, if the problems of safety, waste-disposal and public unpopularity of nuclear power in the West is any barometer to go by, then India might be better off on the whole to leave nuclear power where it does the least harm — inside the atom.

**MYTH :** Nuclear power is environmentally benign and it helps stop global warming.

**FACT :** Not So! Nuclear power plants pollute the environment by releasing radio activity which is a biological form of pollution (See page 3). By examining the nuclear fuel cycle in its entirety environmental problems emerge.

The nuclear fuel cycle begins at the uranium mine where the ore is mined and concentrated into yellowcake which is a combination of Uranium<sup>235</sup> and Uranium<sup>238</sup>. Miners working in these mines suffer all the hazards of those who mine underground, and in addition, face the problems of possible inhaling radio-active Radon gas which dramatically increase their proclivity to lung cancer and death. (Unless very strict standards for occupation health or the protection of workers has been incorporated such mines will be death-traps). The other problem at this stage is the radioactive tailings left behind in the process of concentrating. What does one do with tons of low-level radwaste?

The next, is the fuel enrichment and fuel conversion stage. Safety and environment are no more in risk at the enrichment/conversion facility than in most complex manufacturing facilities, but the large scale use of Plutonium as fuel changes that. And reuse of Plutonium, especially in conjunction with Thorium in fast breeder reactors is precisely the route India wants to follow to synergistically beat its low resources of Uranium. Microscopic quantities of Plutonium can lead to cancer in the long run or immediate death.<sup>8</sup> Also, enrichment/conversion plants can and do provide the basic materials for nuclear weaponry. India's fuel facility is at Hyderabad. The nuclear reactor, the next stage, uses the heat generated by fuel fission to generate electricity, very much like any other thermal plant does. But all similarities ends at that. Environmentally, one has to worry about leakages of radioactivity into the cooling water, into the working areas and into the environment, thermal pollution due to hot water, after it has done its job of cooling the reactor, being released back into water bodies. Furthermore, nuclear plants are likely to severely disrupt the ecological balance of the region. Studies<sup>9</sup> indicate that the temperature of the outlet of the plant condenser would be around 40-45°C. Even a hike of half a degree of Celsius in the temperature of sea water,



How radiation affects human beings

caused by the discharge of secondary coolant circuit water into the sea, can upset the marine ecology beyond redemption, threatening the livelihood of the fisherfolk. A pilot study done at the Idinthakarai coast by the Zoology Department of St. Xavier's College, Palayamkottai indicate that the rare marine species forming the food chain of the area, will disappear even if the temperature rose by a very little. Indian Express (24-7-96) reported of severe dwindling of fish catch in areas adjacent to the Kalpakkam Atomic Power Plant in Madras because of the affect of radioactive effluents discharged into the sea and consequently killing the fish.

Finally, the related myth that nuclear power can help stop global warming while it satisfies the demand for electricity is propaganda from the nuclear lobby (funded in the US by MNCs like Westinghouse) and baseless to say the least. Nuclear power cannot stop global warming. Nuclear reactors generate electricity — only about 1/6 of greenhouse gases come from burning fossil fuels for electricity.<sup>10</sup> Research has shown that a crash programme to offset carbon emissions from coal-fired electricity generators alone would require the construction of 5000 nuclear reactors over the next three decades, most of them in the cost of \$144 b. in



capital expenses annually and electricity generation costs of \$525 b. per year. Even with such a construction programme, carbon dioxide emissions globally would still rise. In fact "...spending on nuclear power can worsen global warming by draining energy investments away from energy efficiency and renewal energy. For each \$100 spent on nuclear power, one metric ton of carbon is effectively released into the atmosphere, that could have been avoided had the money been spent on energy efficiency. Finally, such a nuclear construction programme would generate 100,000 tons of high-level radioactive waste per year, with no resolution to the nuclear waste crisis in sight".<sup>10</sup>

**MYTH:** *Nuclear weapons are affordable and can cut down on conventional arms and forces.*

**FACT:** No nuclear country has accomplished this feat but India can! Unless it is taken for granted that nuclear weapons would, with absolute certainty eliminate war between India and Pakistan, it is difficult to see how expenditures on conventional arms can be reduced in any significant manner. Fifty-three years down the road such weapons have nowhere replaced or substituted in any real sense for conventional weapons. Rather, they have always been an addition, and involved an extra cost over and above high conventional spending. In a recent article<sup>11</sup> Lt. Gen. V.R. Raghavan highlighted some relevant figures for India, for such spending, viz., a study by the Ministry of Defence in 1985 estimated the cost of creating a tiny "minimal deterrent" (of 10 to 20 fission weapons) at Rs.7000 crore at that time. Dr. Jayati Ghosh of JNU estimates that in terms of the domestic rate of inflation, such an amount would work out to around Rs.18,000 crore in current prices. But a substantial part of the expenditure would involve imports. So if the change in rupee value (relative to the US dollar) is taken into account, then this would

amount to Rs.24,000 crore. If it is estimated that around one-third of such expenditure involves imports, then the likely current cost works out to at least Rs.20,000 crore. This relates to the total stock cost of a nuclear weaponisation programme. It should be noted that more than half of the cost of deployment of nuclear arms is usually accounted for by non-nuclear non-missile components and also that a very large proportion of such hardware tends to be imported. This refers to the stock cost of creating a nuclear arsenal. There is also the continuing cost involved in maintaining the so called nuclear deterrent. An estimate made in 1994 puts this at 0.5 to 1 per cent of GDP, or at around Rs.8,000 to Rs.16,000 crores per annum. This alone will increase our military spending by 25 to 40 per cent a year. In reality, these may turn out to be gross underestimates.<sup>11</sup>

### References

1. Spence, M. Exporting the Nuclear Atom, Radical Science, #14 Free Association Books, London, 1984.
2. Sharma, D. India's Nuclear Estate, Lancers Publishers, New Delhi, 1983.
3. Reddy, A.K.N., Is It Necessary or Economical?, SEMINAR, # 370, New Delhi, 1990
4. C.A.N.E. "Nuclear Waste : The Darker Side of Nuclear Power", NAVA, Bangalore.
5. "Dirty Tricks by Decent Mens", Anumukti, #6, Surat 1990.
6. Koen, S. et al. Handbook for Women on the Nuclear Mentality, Wand. Norwich, V.T., 1982.
7. [Interview] with Dr. Rosalie Bertell, Anubhav, # 8, 1995.
8. "Is There a Case for Nuclear Energy?", PPST Bulletin # 1, Madras, 1982.
9. "Koodankulam Nuclear Power Project : Some Issues, E P W, January 7, 1989.
10. Bruno, K. Multinationals and the Environment, Third World Network, New Delhi.
11. Communalism Combat, June 1998, Mumbai.

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## "Nuclear Power ...the world's most dangerous way of boiling water."

*Facts Against Myths is a monthly bulletin of factual information on a number of development myths and fallacies, etc, including information against disinformation campaigns, propaganda and canards spread by communal and fundamentalist forces.*

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