

Turning Dream into a Nightmare

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DR A P J ABDUL KALAM AND Mr Srijan Pal Singh deserve special thanks for their article in the Sunday edition of *The Hindu* (November 6, 2011) entitled “Nuclear power is our gateway to a prosperous future.”

Although most of what they write is irrelevant to their topic and the rest just plain wrong, the very fact that the establishment has to bring out its ‘Big Guns’ to answer the questions raised by the Koodankulam movement, is a testimony to the success of the movement.

Kalam and Singh make the following points:

Because of its millions of times higher energy density, uranium fuel requires much less material handling than coal: “There is a distinct and categorical correlation between the energy consumption and income of a nation—each reinforcing the other.”

The electricity demand will have to grow from the current 150,000 MW to at least 950,000 MW by 2030 for economic growth. The German decision to opt out of nuclear power “suits its current scenario which goes beyond mere concerns of risk posed by nuclear power.” Besides, “Nuclear energy never fit into its goal of energy independence” since its uranium production was much smaller than required.

India has huge deposits of Thorium which is considered to be the nuclear fuel of the future. Thorium has many advantages over uranium: produces eight times more energy for the same mass, has a less toxic waste stream, is more abundantly available. Most prosperous nations extract about 30 to 40 percent of their power from nuclear. (Accompanied by a table of nine countries, the first eight top nuclear producers plus India (15) showing their total nuclear capacity, its share in electricity production and their GDP adjusted by PPP.)

The developed world has a habit to “Misguide emerging nations like India, which are a potential challenge to their neo-age proxy-imperial economic subjugation. What is needed for our India, we Indians have to decide.”

Solar and wind are the greenest sources of power but despite advantages are not reliable due to their dependence on weather conditions. Nuclear on the other hand is dependable having more than 14000 reactor years of experience and an international presence.

A nuclear plant is not a nuclear bomb. Our understanding of nuclear disasters and accidents is coloured by our fears regarding destruction caused by nuclear weapons. While there was a huge loss to property, there was no loss of life either during the accident or in the efforts to

contain it at Fukushima. A lot of progress has been made in nuclear emergency management in the last 25 years after Chernobyl.

Radiation fallout causes no harm to future generations although it does increase the cancer risk in the present generation. There are opportunity costs of not using nuclear. If nuclear is stopped the gap would be filled by using more fossil fuel plants leading to increased pollution and global warming.

Only four major incidents have taken place during the six decades long history of nuclear power generation: Kyshtym, Three Mile Island, Chernobyl and Fukushima. Of these, Kyshtym was due to underdeveloped technology in fuel reprocessing, Three Mile Island and Chernobyl were due to human errors and Fukushima due to extraordinary natural forces. The occurrence of four accidents in six decades does not make a case for abandoning our key energy source for the future. All technological progress comes at an incremental risk.

ONLY A FEW TONS OF URANIUM!

To get those few tons of uranium one needs to dig thousands of tons of ore because the concentration of the uranium in the ore is very small. Uranium Corporation of India (UCIL) claims that it is 0.067% at Jaduguda. However, as shown by this writer in a paper in *Bulletin of Atomic Scientists*, this claim is erroneous since if true, there should have been no shortage of uranium fuel in the country prior to signing of the 123 agreement. The uranium concentration is more likely to be 0.03% at best. This means that each ton of ore that is dug one can at most get a mere 300 grammes of natural uranium. The rest 999.7 kg ends up as waste in places around Jaduguda where it shall continue to spew radiation for thousands of years and cause horrific deformities in children.

MYTHICAL CORRELATION BETWEEN ENERGY PRODUCTION AND NATIONAL INCOME

Actually what this means is that the more energy you use, the richer you are. It does not matter whether that energy is put to do useful work or just frivolously wasted ; your wealth is assured by the very fact that it is produced. In the old days, nucleocrats used to show a straight line graph of energy production versus GNP. This held true for many countries till the “imperial economic subjugation ” of the Arab lands in the Middle East was able to hold oil prices to ridiculously low levels. But after early 1970s, when energy prices began to rise, this correlation broke down as people even in the developed countries began to use energy more efficiently. The energy consumption fell while the GNP continued to rise.

NO SHARP RISE IN ELECTRICITY DEMAND,

NO ECONOMIC GROWTH

This is just a corollary of the earlier point except that Dr Kalam and Singh have subtly substituted electricity for energy. Although electricity is one form of energy, it is not a synonym. In India, electricity meets less than 12% of the total energy needs and in no country is this figure larger

than 30%. Nuclear energy can only produce electricity and is thus in no position to meet our total energy requirement of the future. At today's levels, it can at best address only 12% of our energy needs, the rest 88% is met by other sources. The fact that it actually only meets 2% of this 12% today, is another story.

THE CASE OF GERMANY

It is rather strange that Germany, no doubt a very rich and energy surplus country had just kept seven nuclear power plants going although they did not “fit into its goal of energy independence” just to have something to shut down when Fukushima struck. All the more strange because just a few months before, the Angela Merkel government had extended the life of these very reactors—a decision they were forced to rescind following large public protests after Fukushima. India on the other hand will of course, never compromise on energy independence, though unfortunately we too produce far less uranium than our needs and signed the 123 treaty and have been so active in changing our liability laws.

THE THORIUM CARROT

The great advantages of thorium and especially our large deposits were well known even fifty years ago when Dr Homi Bhabha first formulated the three stage nuclear programme. The third stage envisaged large scale utilization of thorium deposits within 20 to 25 years. Even after fifty years we still seem to be at least 25 years away from being able to realize this dream. Neither Americans, or the French, Russians, Canadians, British, Japanese, etc. seem interested in thorium technology. (Why should they since it is we who are sitting on the deposits.) Secondly thorium based electricity costs are likely to be even greater than those based on uranium which are already uncompetitive in the marketplace. With nobody to buy, beg, borrow or steal from, thorium dreams are likely to remain just dreams in the foreseeable future.

PROSPEROUS NATIONS RELY ON NUCLEAR ENERGY

The only ‘prosperous’ countries having more than 30% of their electricity coming from nuclear were France, Ukraine and South Korea. Then Ukraine, it turned out to be ranked at 102 in the list of prosperous nation by GDP (PPP) per capita, although the share of nuclear in its electricity is 48%. All the others in the table including US, Japan, Russia, UK, and Canada had their nuclear share of electricity production less than 30%. The most prosperous countries by per capita GDP were Qatar, Luxembourg, Singapore, Norway, and Brunei, none of which were to be found anywhere in the table presumably since their nuclear shares are not outstanding. Thus, to conclude that most prosperous countries have nuclear share of their electricity production in the 30 to 40 percent range is poetic license.

PROXY-IMPERIAL ECONOMIC SUBJUGATION

In the context (Koodankulam protests) in which the Dr Kalam and Singh article has been written, this invocation is rather rich, since while foreign inspiration for the protest are purely

speculation, the fact that the plant has been made by foreign money and expertise is undeniable.

It does not behove those like the nuclear establishment in India, who have been moving heaven and earth to save foreign suppliers from liability, even for willful negligence to wrap themselves in the flag so blatantly.

DEPENDABILITY— THY NAME IS NUCLEAR

Strange countries like Germany and Denmark find solar and wind dependable enough despite their intermittent nature and produce around 20% of their electricity dependably from these ‘undependable’ sources, while our rulers, despite our surfeit of Sun, seem to think that there is no alternative to nuclear. But even here, just during the last two decades, wind has already built capacity one and a half times more than nuclear has managed to do with all the mollycoddling of the last sixty years. Japan is currently realizing the true dependability of nuclear since more than a third of its reactors are currently out of action following the earthquake and tsunami in March. They are likely to remain in this state of limbo, for quite some time due to ‘irrational’ public opposition to restarting them.

NUCLEOPHOBIA

The destructive might of an atom bomb is because of the blast, the heat and also due to radiation. This was observed and documented in Hiroshima and Nagasaki. While most nuclear reactors will probably not explode like a nuclear bomb (no bets on fast breeder reactors like the one under construction at Kalpakkam) the radiation contained within is hundreds of times larger than that within a bomb. So the radiation contamination of surrounding countryside is hundreds of times larger than that produced by the bomb. Hiroshima and Nagasaki are thriving cities today but the area surrounding Chernobyl and Fukushima will not permit human habitation for centuries.

The main ‘lesson’ nuclear establishments all over the world learned from Chernobyl was that ‘radio-phobia’ is a bigger danger than radiation. Ignorance is bliss. Keep the people in ignorance through misinformation.

First say nothing.

Next, if forced to say something give out a very low figure by ‘mistake’.

If your lies are detected, apologize profusely but keep repeating a variation of the lie. Increase ‘safe’ radiation limits twenty times.

Whether this management method is ‘better’ or worse only time would tell, but if it does prove to be the wrong course, then goodbye, Japan. The country would have sacrificed its already few young on the alter of ‘better ’ nuclear emergency management. As far as, “Not one person died at Fukushima ” myth, the tsunami has conveniently wiped out the evidence.

Many keep dying doing the cleanup but TEPCO's mastery of disinformation techniques has successfully kept their deaths hidden from the mainstream media.

The radio-nuclides released from catastrophes like Chernobyl and Fukushima like caesium-137 and strontium-90 for instance have long half lives. They shall remain in the environment for far longer than one generation. There is no doubt that our children and their children will ingest and inhale them and suffer the consequences. Even the most die-hard nucleocrats, in the French and US nuclear regulatory agencies have accepted the need to move beyond Hiroshima-Nagasaki data of the RERF for radiation effects. The mutagenetic effects of radiation have been known since they were first demonstrated by Hermann Muller in 1926 and that later won him a Nobel prize. It is not that genetic effects of radiation are not well known and documented. They have just been ignored time and again so that the world was not denied the 'benefits' of nuclear power.

OPPORTUNITY COSTS OF USING NUCLEAR ENERGY

Dr Kalam and Singh have enumerated what they term the opportunity costs of not going nuclear. However, they ignore the opportunity costs of going nuclear. Even a staunchly pronuclear publication like *The Tech* (MIT's oldest and largest technology newspaper) has published an article that admits that by any realistic reckoning new nuclear costs are likely to be at least more than twice as much as the costs from a new gas fired electricity generation in the US and cannot be commercially competitive. For India to follow a sensible energy path, the first priority must be to meet the real needs of the poorest section of the population. The biggest use of energy in the country is for domestic cooking. Electricity has no role to play in this. Heating using electricity is extremely *inefficient*. Since nuclear energy can make only electricity, it does not answer to our real energy needs. Even if one ignores the 88% of our energy requirements which are met by sources other than electricity and concentrates on the electricity sector alone, the first priority should be to provide electricity to the 400 million people who have no access to it today. Nuclear energy due to its inflexibility to follow demand, does not meet this need at all.

Today, Kerosene has to be subsidized since otherwise a large section of the country would be condemned to live in darkness since not everybody has access to electric lighting. But Kerosene subsidy implies diesel subsidy as well to prevent adulteration which leads to the obscene phenomena of diesel luxury cars gobbling up this subsidy ostensibly meant for the poor.

All the energy sources used by the rich today are subsidized while none used by the poor are. It is this "Somebody has to pay the price of development but it better not be me," kind of development that people in Koodan-kulam are protesting about.

Even if one confines to the incidents picked by Dr Kalam and Singh, Fukushima daiichi is not just a single reactor. There are actually six of them, four of which had explosions, one of them even though it had been emptied of fuel long before the tsunami. Seven major accidents (incidents is the classic nukespeak) in just 14000 reactors years means an average of a major

catastrophic accident every 2000 reactor-years. Since there are some 437 operating power reactors in the world, this means that an accident on such a scale is likely every four and a half years. Seen in this context, the safety record of nuclear industry does not seem to be something to be proud of.

Dr Kalam and Singh rhetorically ask, “Whether we will allow an accident in a 40-year-old reactor to derail our dreams to be an economically developed nation?”

While reactor 1 was indeed 40 years old having started in 1971, there were accidents in reactors 2 (1973) and 3 (1974) as well and the spent fuel storage area of reactor 4 (1979) also.

Second, that our dreams need to be inclusive of everybody and not just the fat-cats.

Third, the risky vehicle that they have chosen to turn their dreams into reality is likely to turn the dream into a nightmare from hell. □□□