

A CASE STUDY APPROACH ON KOODANKULAM NUCLEAR POWER PROJECT

Dr. J. P. Kumar

Professor, GEM Business Academy, Gobichettipalayam

Email: godjpkumar@gmail.com

Ms. R.Ambigai,

Assistant Professor, Department of MBA, SSKCET, Coimbatore

Email: ambicvr@yahoo.co.in

ABSTRACT

As a developing nation we need energy to support our future industrial & domestic needs. But the way to generate this energy does not depend solely on nuclear energy. Throughout the world many developed countries are shutting down their nuclear reactors and starts looking into alternative ways to produce energy in a safer and greener way. India can achieve its future needs but it will not be the safe for the country's internal security and safety.

Koodankulam is a place in the Tirunelveli district in Tamil Nadu, India. It is situated 25 km north-east of Kanyakumari and 35 km from Nagercoil.

The place is notable as the construction site of the Kudankulam Nuclear Power Plant. It is also the location of hundreds of windmills used for power generation, eight of which are located inside the grounds of the nuclear plant.

Since the beginning of 2011, this place has been embroiled in a nuclear plant controversy over its safety by its people. Recently there have been several struggles by local people against the project. Local people are afraid that in case of a natural disaster the reactor may blast. This paper will deal about the various dimensions of Koodankulam Nuclear Power Plant with both its positive & negative sides.

Keywords: *Koodankulan, Nuclear, Power, Project, Electrical Energy, Nuclear Reactors, Tirnelveli, Tamilnadu, KNPP*

Introduction

India has developed an installed capacity of 5,340 MW from wind power just over the last decade compared to 3580 MW from nuclear power developed over the last five decades. Nuclear power is expensive and dangerous. Its raw material is in short supply, as a result of which India is forced to sign a deal with the US, and scientists have no idea how to dispose off its radioactive waste. Wind power is dependent on naturally flowing wind which is in abundant supply available for free and doesn't generate any regular waste. That is probably why the Koodankulam nuclear power plant has installed eight wind mills inside its premises.

The deal, which does not have approval of the Indian parliament is not in the interest of people of this country and must be rejected. India must implement strict international safeguards in handling nuclear technology and materials and must develop an environment friendly power programme based on renewable resources. India has enough potential in solar and wind energy.

In a public hearing conducted by the people, after the authorities had postponed their public hearing thrice, in Tuticorin on March 30, 2007, there was an informed unanimity in opposition to the nuclear power plant. The speakers consisted of ordinary fisherfolk, priests, intellectuals, doctors and scientists. As it happens in any big project the people who get affected the worst are poor.

Dr Kuglandi from Kalpakkam informed that based on random sampling it was found that 2-4 cancer deaths in a population of one lakh per year is normal. However, in Kalpakkam this ratio is 3 in a population of 25,000. The tourists who come to Mamallapuram avoid eating the fish here, which strangely enough does not attract flies like it does elsewhere.

Koodankulam Nuclear Power Plant is a nuclear power station currently under construction in Koodankulam in the Tirunelveli district of the southern Indian state of Tamil Nadu. Project investment cost to India was estimated to be US\$ 3.5 billion in a 2001 agreement.

History of Koodankulam Nuclear Power Plant

In 1988, during Rajiv Gandhi period a MOU (Memorandum of Understanding) for construction of nuclear power plant in India was signed between two countries India and Soviet (Russia). But due to several factors from political and economic crisis the project has been put on hold since there was a breakup in soviet and moreover with the objection from US stating that the agreement signed didn't meet up with the current Terms and Conditions from the group of nuclear suppliers.

Previously before 2004 the water reactor equipment was brought through roads as their mode of transport from Tuticorin port and due to various difficulties of damages incurred during its transportation it decided to select a Naval point base and come up with an idea to develop a small port near the tip of the country and they felt the best place would be Koodankulam in southern part of Tamil Nadu and then a small port become operational on January 14, 2004 and the main purpose of its construction is to

receive baggage's carrying oversized light water reactor from ships anchored at a few distance of half a km from its port.

In 2007 a MOU was signed between India and Russia and when Russian president Vladimir Putin visited India he had discussion with Manmohan Singh and both countries have planned to promote the use of nuclear energy to certain heights.

Run through of Koodankulam Nuclear Power Plant in Tamil Nadu

- 1988** MOU signed between India and Soviet for construction of Nuclear Power Plant in India.
- 1990** First phase of protest was held for opposing the diversion of water from Pechiparai dam.
- 1998** Till 1998 the project of agreement was put on hold due to break up in Soviet.
- 2000** Construction of Koodankulam Nuclear Power Plant Started Before 2004 – Road has used as the mode of Transport for Reactors to be used in power plant.
- 2004** Small Port was been constructed for transportation and become operational in Koodankulam.
- 2007** MOU was signed between India and Russian to promote Nuclear Energy.
- 2008** The KNPP team decided to go for additional four reactors at the atomic station.
- 2009** The first schedule project will begin in December 2009.
- 2010** Hydraulic Test was carried out at power units and Second schedule will be on March.
- 2011** First schedule of operation begins in June. In the middle of March 2011 India has started the main stage of equipment tests at first nuclear power unit of Koodankulam under construction. The commissioned of Nuclear project will be on April 2011 Several protest from public towards KNPP.
- 2012** Second schedule plan of operation will be on March.

Reasons behind the need for Koodankulam Nuclear Power Project

We have been opposing the Koodankulam Nuclear Power Project (KNPP) ever since it was conceived in the mid-1980s. The people of Koodankulam village themselves were misled by false promises such as 10,000 jobs, water from Pechiparai dam in Kanyakumari district, and fantastic development of the region. We tried in vain to tell them that they were being deceived. Without any local support, we could not sustain the anti-Koodankulam movement for too long.

Now the people of Koodankulam know and understand that this is not just a fisher folk problem, they may be displaced, and they have to deal with radioactive poison. Their joining the movement in 2007 has invigorated the campaign now. And almost all of us here in the southernmost tip of India oppose the Koodankulam NPP for a few specific reasons:

1. The KNPP reactors are being set up without sharing the Environmental Impact Assessment (EIA), Site Evaluation Study and Safety Analysis Report with the people, or the people's representatives or the press. No public hearing has been conducted for the first two reactors either. There is absolutely no democratic decision-making in or public approval for this project.

2. The Tamil Nadu Government G.O. 828 (29.4.1991 – Public Works Department) establishes clearly that “area between 2 to 5 km radius around the plant site, [would be] called the sterilization zone.” This means that people in this area could be displaced. But the KNPP authorities promise orally and on a purely ad hoc basis that nobody from the neighboring villages would be displaced. This kind of ad hocism and doublespeak causes suspicion and fears of displacement.
3. More than 1 million people live within the 30 km radius of the KNPP which far exceeds the AERB (Atomic Energy Regulatory Board) stipulations. It is quite impossible to evacuate this many people quickly and efficiently in case of a nuclear disaster at Koodankulam.
4. The coolant water and low-grade waste from the KNPP are going to be dumped in to the sea which will have a severe impact on fish production and catch. This will undermine the fishing industry, push the fisher folk into deeper poverty and misery and affect the food security of the entire southern Tamil Nadu and southern Kerala.
5. Even when the KNPP projects function normally without any incidents and accidents, they would be emitting Iodine 131, 132, 133, Cesium 134, 136, 137 isotopes, strontium, tritium, tellurium and other such radioactive particles into our air, land, crops, cattle, sea, seafood and ground water. Already the southern coastal belt is sinking with very high incidence of cancer, mental retardation, down syndrome, defective births due to private and government sea-sand mining for rare minerals including thorium. The KNPP will add many more woes to our already suffering people.
6. The quality of construction and the pipe work and the overall integrity of the KNPP structures have been called into question by the very workers and contractors who work there in Koodankulam. There have been international concerns about the design, structure and workings of the untested Russian-made VVER-1000 reactors.
7. The then Minister of State in the Ministry of Environment and Forest Mr. Jairam Ramesh announced a few months ago that the central government had decided not to give permission to KNPP 3-6 as they were violating the Coastal Regulation Zone stipulations. It is pertinent to ask if KNPP 1 and 2 are not violating the CRZ terms.
8. Many political leaders and bureaucrats try to reassure us that there would be no natural disasters in the Koodankulam area. How can they know? How can anyone ever know? The 2004 December tsunami did flood the KNPP installations. There was a mild tremor in the surrounding villages of Koodankulam on March 19, 2006. On August 12, 2011, there were tremors in 7 districts of Tamil Nadu.
9. Indian Prime Minister himself has spoken about terrorist threats to India’s nuclear power plants. Most recently, on August 17, 2001, Minister of State for Home, Mr. Mullappally Ramachandran said: “the atomic establishments continue to remain prime targets of the terrorist groups and outfits.”

10. The important issue of liability for the Russian plants has not been settled yet. Defying the Indian nuclear liability law, Russia insists that the Inter-Governmental Agreement (IGA), secretly signed in 2008 by the Indian and Russian governments, precedes the liability law and that Article 13 of the IGA clearly establishes that NPCIL is solely responsible for all claims of damages.
11. In 1988 the authorities said that the cost estimate of the Koodakulam 1 and 2 projects was Rs. 6,000 crores. In November 1998, they said the project cost would be Rs. 15,500. In 2001, the ministerial group for economic affairs announced that the project cost would be Rs. 13,171 crores and the Indian government would invest Rs. 6,775 crores with the remainder amount coming in as Russian loan with 4 percent interest. The fuel cost was estimated to be Rs. 2,129 crores which would be entirely Russian loan. No one knows the 2011 figures of any of these expenses. No one cares to tell the Indian public either.
12. The March 11, 2011 disaster in Fukushima has made it all too clear to the whole world that nuclear power plants are prone to natural disasters and no one can really predict their occurrence. When we cannot effectively deal with a nuclear disaster, it is only prudent to prevent it from occurring. Even the most industrialized and highly advanced country such as Germany has decided to phase out their nuclear power plants by the year 2022. Switzerland have decided to shun nuclear power technology. In a recent referendum, some 90 percent of Italians have voted against nuclear power in their country. Many Japanese prefectures and their governors are closing nuclear power plants in their regions. Both the United States and Russia have not built a new reactor in their countries for 2-3 decades ever since major accidents occurred at Three Mile Island and Chernobyl.
13. In our own country, Mamta Banerjee government in West Bengal has stopped the Russian nuclear power park project at Haripur in Purba Medhinipur district and taken a position that they do not want any nuclear power project in their state. Similarly, the people of Kerala have decided not to host any nuclear power project in their state.
14. Finally, the Indian government's mindless insistence on nuclear power, utmost secrecy in all of its nuclear agreements and activities, and its sheer unwillingness to listen to the people's concerns and fears make us very doubtful about the real benefactors of all this nuclear hoopla. Is it all for us, the people of India? Or for the corporate profits of the Russian, American and French companies? Or for the Indian military? Are the lives and futures of the Indian citizens inferior to all these?

Facts and reasons for shutdown of Koodankulam Nuclear power plant

No proper canvassing has been given with the public in and around Nuclear power plant about the issues and construction of power plant.

The opinion suggested regarding the plant by the Russian Scientist was made hidden and no Site Evaluation Study has been given to the public.

Safety Analysis Report has not been submitted to the public and press.

According to Tamil Nadu Government act 828 – There should be no building other than power plant building till 2 km and 2 – 5 Km area should be a sterilization zone and the fact towards the people and their house location was hidden.

According to **AERB** report within 5 Km there should not be population more than 20,000 and within 10 Km no area should be populated with 10,000 peoples but near to KNPP within 3 Km itself 20,000 people live in a village and 12,000 people from Idithankarai village and 450 families from Kasa village are being populated.

Moreover within 10 Km there should be only less populated peoples but it doesn't meet up with the criteria.

Within 30 Km 1,00,000 population city or town should not be located but Nagerkoil is located within 28 Km from the plant.

As said by AERB report within 20 Km radius no Tourism spots, Historic place would be located but world popular Kanyakumari is located within 15 Km. Moreover it may not be possible by the government to relocate all these peoples to different areas.

In 2004 December Tsunami central government investigation towards Peridar would be aware to public.

Bad condition of the pipe, Local contractor, politicians, low priced goods are some reason of statement that comes in day today news from various Medias by taking this issue into consideration.

On 26/9/2006 Dr.Abdul Kalam visited the plant and during his visit an employee met with an accident as he fell down from the roof and think about the safety measures.

Radiation from radiators, salt formulated from salt Industry, Clay, Fertilizers by discharging into sea will kill out the oceanic life. Do we want it to happen ? Till now no such situation has occurred but do we want his to happen in our future?

The statement indicating Pericator will not occur would be a false statement and can be non acceptable. In 2003 Feb 9th at 9.45 pm in Tirunelveli district at Palyankottai a small earth quake occurred. In 2006 March 19th by 6.50 pm near Kudankulam village like Kannankulam, Anjukaram, Mayiladi and at Samythoppu an earth quake occurred. Moreover an earthquake also occurred in Karur and from this statement we say that in 2011 from august first week itself in Tamil Nadu earth quake has been occurred in 7 districts.

The incident on March 2011 at Pukushima in Japan would never be forgotten and moreover KNPP was built before Tsunami and the safety measures suggested may not be acceptable.

Moreover then and there terrorist threats the people towards Power plant and can be witnessed from various Medias.

During Feb 2007 in the former government period Electricity Minister Arcot Veersamy said free safety schemes will be given to the people in and around the plant. But before one year a discussion was held between India and Atomstary Exports of Russia regarding loss occurred towards the projects. India asked Russia for money if any accident occurs but Russia failed to it and Russia said they have full details regarding the agreement signed between two countries in 2008. Moreover it also noted still no people have got fund relief for the disaster occurred in Bhopal.

Waste Management was a big issue. They said KNPP waste would be taken to Russia according the agreement but later they said they have to undergo a Re hydration process in India itself. On an average 30 Tons of Uranium is to be used and think what would the amount after few years since it may generate more radiation and we would be in a position to in heal it and create disaster to oceanic life and will even lead us to poverty.

In 1988 for installation of two radiators they said it would cost 6000 crores and in 1997 April the initial budget said by them was 17,000 crores and later in 2001 as said by our ministers a total of 13,171 crores was the cost incurred and according to the statement India has decided to give 6,755 crores and remaining to be got from the Russian government on Interest. Think about the situation of costs.

According to the survey Germany has decided to close all its power plant within 2022 and also countries like Swizz, Mexico has decided to close they power plant and even with the disaster occurred it Japan it even made them to close their plants.

Types of people opposing the Koodankulam Reactors

1. Those who are displaced by the project and who have not been adequately compensated due to the existing archaic compensation packages.
 - They need to be compensated adequately.
2. The fishermen who have apprehensions about
 - The fishing rights in that area.
 - The possibility of radiation getting into the fish.
 - The possibility of reduction in fish growth due to the rise in temperature of sea water locally

All these are pure propaganda made by some of the people who have real apprehensions about the safety of nuclear power and they need the support of these fishermen to make their agitation stronger.

- Regarding the fishing rights, there is absolutely no doubt that there is no restriction for them.

- Regarding the radiation, this is totally a myth that radiation is being let into the sea. Please note, the radiation is associated with the fuel and it is always intact within the reactors.
- Regarding the temperature rise, it is a common thing in any power plant which is set up on the coast, be it coal fired or nuclear. There are hundreds of power plants like this set up on the coast and all of them let out hot water at about 5 to 8°C higher than the ambient temperature. This temperature rise is very local and it gets normalized within few hundred meters. It will not have any impact on the growth of fish or any other marine life.
- So, the fishermen need to have no apprehensions whatsoever with regard to their fishing rights or the radiation getting into the fish.

3. The so called intellectuals who genuinely feel that nuclear power is unsafe and bad.

- These people have developed some sort of an aversion to nuclear power due to various reasons like, it is associated with atom bomb, it has been always projected in bad light by the media due to a complex reason and above all, the “fear of unknown”.
- All these are purely “perceived risks”. It is like fear for ghost, fear for darkness, fear for height, fear for water, etc. After listening to the whole explanation, they will come back to the same question, “if that happens” “if this happens” what will you do? We would have given explanation for everything. Being too technical and complex, only to some level they can understand. Beyond that point they cannot understand the technicalities.

It is difficult for even engineers who have not studied nuclear engineering or worked in nuclear power to comprehend the overall nuclear energy issues. At this point, they will stop listening and obviously nothing goes into their mind. Naturally, they go back to their own perception and it becomes a dead lock. It is something similar to the argument about ghost or god. These people being genuine / influential people and who are in touch with the general public, they are able to effectively convey their perception based fears to the general public. These types of people are there throughout the world and throughout the history.

Experts' opinions

R. Chidambaram, Centre Principal Scientific Adviser, KNPP

"The reactors at Koodankulam are very safe. Our scientists have looked at all safety aspects of the project and ensured it is a very safe reactor. So they hope all opposition against it will be over and the project will come up in due course". Stating that nuclear power was an inevitable option to meet India's energy needs, he said the plant on being commissioned, would add 2,000 MW power to the national grid.

"Large developing countries have to look at all sources of power. To my mind, nuclear energy is an inevitable option for satisfying India's energy needs," he said.

"If you look at the present level of percapita electricity consumption, in my calculation you have to raise it six to eight times before India can become a developed country in the fullest sense of the term,".

M. R. Srinivasan, former Chairman and current member of Atomic Energy Commission:

- The Koodankulam nuclear power plant belongs to 3rd generation of design Evolution and Fukushima reactors belong to 1st generation design.
- There are four Independent systems each with its own diesel generated sets (8 MW) pumps and heat exchanger and even if one unit fails the other can acts as a back up to provide power without interruptions.
- The level of diesel generator its switch gear and controls are several times higher than Tsunami and flood level expected at the plant.
- Koodankulam is the first reactor to have Passive Cooling System reactor where it helps to transfer and reduce heat with the help of the water in the generator.

Srikumar Banerjee, Chairman, Atomic Energy Commission

"Minimum maintenance activity should be carried out at the plant for its health and its future."

SP Udayakumar, *People's Movement Against Nuclear Energy*

"The nuclear plant is unsafe" and "the safety analysis report and the site evaluation study have not been made public. No public hearing was held. It's an authoritarian project that has been imposed on the people."

Mr A.P.J. Abdul Kalam, Former President of India & Scientist

"The plant is safe in all aspects. There is no need to worry about the safety aspect of the plant, as it is in a low frequency seismic zone. There is also no threat of a tsunami as the plant is 1,300 km away from the seismic centre point. Besides, the plant is 13.5 metres above sea level," he said.

Conclusion

Several protests by public and statement from central government and state political parties are being raised as an issue to find an opt solution. The government should be in a position to think about the situation of its people. There are several ways to generate power and the government should not build up these types of plants as it threatens the life of the people and creates disaster. Government should think about the people or else to depend on the electricity needed for the people.

To conclude, by understanding the importance of public and it safety the current communication gap and relationship with the power plant team and public can be

highly reduced. Moreover with several campaigns and programs conducted in the public, knowledge about power plant its importance and safety measures can be highly conveyed and educated to the people will let both public and government us to have an end towards the issue. The role the committee plays a vital role in producing a decisive report which could satisfy all the stakeholders involved in the Koodankulam Nuclear Power Plant. The public can also realize the practicality of the project and it's necessity for the state before blindly opposing it.

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