

Why Bangladesh Must Go Nuclear

by Ramtanu Maitra

Facing an acute shortage of electrical power, the government of Bangladesh has revived the almost five-decades-old project to build a nuclear power plant in Rooppur. Last March, Prime Minister Sheikh Hasina Wazed made it official, when she told the Parliament that her government would set up a nuclear power plant in Rooppur to meet the country's growing energy demands.

Bangladesh, with a population close to 155 million, has an installed power generation capacity of a little more than 4,000 MW average per day. Dhaka claims the power demand is close to 5,000 MW, making it about a 20% power-short nation. However, the power demand figures of any country, projected by the authorities, have no real meaning, since they reflect low expectations, i.e., that there will not be sufficient power to meet the needs of a growing economy. In fact, there is a need for tremendous expansion of economic activity, and the power to fuel it, to keep up with a growing population.

Power-Hungry Bangladesh

Now, Dhaka has come to accept that Bangladesh faces a massive electricity shortage that has hit its main non-agricultural employment source, the textile industry. Last year, an average generation of 3,000 MW at peak demand hours, 2,000 MW short of "actual demand," provoked the violence that broke out in a northern Bangladesh town, leaving at least 20 dead in clashes between police and farmers, who also need increased power for irrigation.

In other words, if Dhaka goes forward now with a nuclear-based electrical-power-generation program, it is almost a certainty that manufacturers within the country, and across the world, will be setting up facilities in Bangladesh. In addition to possessing a highly competent workforce, Bangladesh is on the verge of ensuring its food security. But the country has the capability to become more than an agrarian nation. It has the skilled manpower to become a large-scale manufacturer of

small and medium-scale industries to meet its own developmental requirements, and still have surplus for export.

However, to achieve that end, Bangladesh must immediately focus on a number of areas of economic development. These include power generation and strengthening its basic physical infrastructural requirements, such as railroads, water sources, education, and health care. On the other hand, because of its lack of electric-generation capabilities, and lack of adequate power sources, Bangladesh has remained one of the poorest nations in Asia. It seems that with the declaration to revive the Rooppur nuclear power plant, Sheikh Hasina has taken the necessary step to transform Bangladesh from an agrarian nation to an agro-industrial nation.

Nearly 80% of Bangladesh's power comes from its large reserves of natural gas. Studies conducted in recent years on natural gas reserves and undiscovered resource potential have all concluded that Bangladesh has a mean undiscovered gas resource of at least 32 trillion cubic feet (Tcf). The two most widely recognized studies are the United States Geological Survey (USGS)/Petrobangla Study (2001), which declared the mean undiscovered resource potential to be 32.1 Tcf, and the Hydrocarbon Unit/Norwegian Petroleum Directorate (NPD) Study (2001), which declared the mean undiscovered resource potential to be 41.6 Tcf. Both of these studies only took into account offshore acreage out to a water depth of 200 meters. However, Bangladesh needs to use its gas reserves, at least the most of it, in developing a large fertilizer sector for its agriculture, and not use natural gas for power generation.

No Option But Nuclear

Since Bangladesh consists of low and flat lands, other than the hilly regions in the North and Northeast, its hydropower generation potential remains very small. The single hydropower station, with seven units, located in Kaptai, across the river from Karnafuly, has a generating capacity of 230 MW. The Karnafuly plant generates less than 5% of Bangladesh's total power. There had been much talk of micro-hydropower in Bangladesh. A number of foreign experts have visited the country, but considering the needs of 155 million people, it has been established that micro-hydropower may serve the requirements of some very small villages, but will not contribute in a significant way to the



Bangladesh Embassy

A massive electricity shortage has struck Bangladesh's main non-agricultural economic sector, the textile industry, underlining the urgent need for nuclear power. Here, a young woman works in a textile factory.

geared up presently to develop these hydro-power-generating facilities.

EIR Lent Its Support

As a result, Bangladesh is left with little choice but to exploit nuclear power for economic development, and provide a positive future to its growing population. In fact, building a nuclear power plant in Rooppur, located in western part of Bangladesh, was proposed as far back as 1961, when it was still a part of Pakistan. Since then, a number of reports have affirmed the technical and economic feasibility. The Rooppur site in Pabna district was selected in 1963, and land was acquired. The Bangladesh government, in 1999, expressed its firm commitment to build the plant. In 2001, it adopted a national Nuclear Power Action Plan, and in 2005, it signed a nuclear cooperation agreement with China.

country's overall power requirements.

In 1984, six Chinese experts visited Bangladesh and identified a number of potential sites for development of micro-hydropower plants. Among them, only Mahamaya Chara has been taken up for development of an integrated project for flood control, irrigation, and power generation. A working group has been formed by the engineers of Bangladesh Power Development Board (BPDB) and Bangladesh Water Development Board (BWDB), to carry out groundwork for the project. A dam is proposed to be constructed on the Mahamaya Chara to retain monsoon run-off, from a drainage area of about 10.5 km², and to provide irrigation facilities from the reservoir behind the dam. There are also plans to utilize the reservoir water for the generation of hydroelectricity. A mini-hydropower plant would be installed at the foot of the dam. However, none of these proposals have seen the light of the day. Moreover, if these projects were taken up, they would not be able to produce more than another 150-200 MW of electrical power.

Some point out, and their views are feasible in the long run, that Bhutan and Nepal, which together have the potential to generate more than 100,000 MW of hydropower, can export a significant amount of electrical power to Bangladesh. But a nation of 155 million cannot afford to wait for these developments, over which it has little control. Moreover, neither Bhutan nor Nepal is

In 2007, the Bangladesh Atomic Energy Commission proposed two 500 MWe nuclear reactors for Rooppur by 2015, quoting likely costs of US\$0.9 to \$1.2 billion for a 600 MWe unit and US\$1.5 to \$2.0 billion for 1,000 MWe. In April 2008, the government reiterated its intention to work with China in building the Rooppur plant, and China offered funding for the project.

EIR has had a long association with Bangladesh's nuclear program. In 1985, several *EIR* representatives were invited to participate in a seminar in Dhaka, by the then-Bangladesh Atomic Energy Commission (BAEC) chairman, Dr. Anwar Hossain. His number two at the BAEC was Dr. M.A. Wazed Mian, late husband of the present Prime Minister Sheikh Hasina. (Dr. Wazed passed away in May of this year.)

In that seminar, *EIR* spokesmen and a number of other participants strongly recommended nuclear power development for Bangladesh as the only feasible option for the country to progress. *EIR* personnel (including the author) visited the site in Savar where BAEC was planning to set up a research reactor. That was accomplished in 1986, when a 3 MW (thermal) research reactor was installed, and has since been running satisfactorily, producing radioisotopes for medical and other uses, and training personnel in reactor operation and safety. The Institute of Nuclear Agriculture (INA) was originally established by BAEC, and now operates in the Agriculture Ministry.

Dr. Hossain, in a 2007 article in the *Daily Star*, pointed out that “the history of missed opportunities in nuclear power production is really unfortunate.” During this period, however, BAEC has strengthened its physical and manpower infrastructure and has increased its collaboration with the International Atomic Energy Agency (IAEA), Regional Cooperation for Asia (RCA), and other countries.

It was, therefore, a great moment of joy and satisfaction to Dr. Hossain and his team of nuclear scientists and engineers, when Prime Minister Sheikh Hasina told parliament that her government would set up a nuclear power plant to meet the country’s growing energy demand. “We are taking initiatives to set up a nuclear power plant at Rooppur site,” she said in response to a question from a parliament member.

According to a proposal prepared by the government, a 600 MW nuclear power plant will be constructed at Rooppur; the IAEA has already approved a Technical Assistance Project for Rooppur Nuclear Power Plant, to be initiated by 2011. And, proposals floated by Russia, China, and South Korea, the three nations vying to build the plant, indicate that a 1,000 MW plant will be built at Rooppur.

Russia, China, South Korea in the Fray

Russia is now seriously moving ahead to build the plant. Russian envoy Gennady Trotsenko has presented a proposal to Yafes Osman, Bangladesh’s Minister for Science and Information and Communication Technology. “We have placed a proposal for undertaking efforts to set up a nuclear power plant in Bangladesh,” Trotsenko told reporters after meeting Osman.

China and South Korea made similar proposals last year, but Bangladesh has not yet firmed up the decision with any country. A senior science ministry official said, however, that the authorities were also studying the



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Bangladeshi Prime Minister Sheikh Hasina Wazed has made it official: Her government will proceed to build the long-delayed nuclear power plant at Rooppur. Russia, China, and South Korea are vying for the contract.

offers from China and South Korea.

According to Dr. Abdul Matin, the former chief engineer of the BAEC and a specialist in nuclear reactor technology, the connection between Russia and Rooppur is not a new one. In 1969, the Soviet Union proposed to build a 400 MWe nuclear plant with two generators, each of 200 MWe capacities, to be installed in two phases at Rooppur. V/O Technopromexport of Moscow prepared a feasibility report under an agreement signed with the Pakistan Atomic Energy Commission (PAEC).

Dr. Matin and his colleague, the late Kazi Abul Hasnat, went to Moscow in 1969 to review the final draft of the feasibility report. They also visited a nuclear plant at Novovoronezh. At the time, Dr. Matin points out, the reactor proposed by Russia was considered to be too large for the

western grid of what was then East Pakistan. In 1969, Bangladesh’s western grid was not inter-linked with the eastern grid, due to its low power demand. Fearing it would result in serious system instabilities in case the reactor tripped, authorities did not pursue the proposal.

Another concern then was that the proposed Russian reactor did not have a containment building, essential to prevent the release of radiation into the atmosphere in case of a nuclear incident.

Subsequently, Dr. Matin points out, East Pakistan received another proposal from a subsidiary of Westinghouse, based in Belgium, for a 200 MWe nuclear plant. The proposal, complete with a financial offer, was considered to be more suitable for Rooppur. A fresh feasibility report was prepared for a 200 MWe nuclear plant, and to make it more acceptable to the financing agencies, it was published in the name of a Swiss consulting firm. Following a thorough evaluation of the bid and detailed negotiations with the Belgians, the final contract was made ready for signature.

Kissinger's Dirty Hands

But this deal was also shelved due to the breakout of the 1971 War of Independence, which gave birth to the nation of Bangladesh. According to Dr. Matin, years later a retired diplomat of Bangladeshi origin, who held the Russian desk at the foreign ministry of Pakistan during late 1960s, told him that the nuclear authorities committed a blunder by rejecting the Russian offer. The Russians were ready to build the plant, and the new-born Bangladesh would have had a nuclear power plant at Rooppur as a major power source. According to this former diplomat, the Belgian proposal was a diplomatic game played by another superpower (read: the United States under U.S. Secretary of State Henry Kissinger) to prevent any nuclear collaboration between Pakistan and Russia. Rooppur thus became a victim of superpower rivalry during the Cold War era.

In case Russia wins its bid to build the Rooppur plant, it will likely be a Generation III pressurized water reactor. There are indications that BAEC would like such a reactor, since the Generation III reactors incorporate simple and compact design concepts with passive safety systems. They have a longer plant life (50 years instead of 30); a higher efficiency (36.56% compared to 31.6%); and a utilization rate of 90%. Bangladesh would prefer 1,000 MWe Generation III reactors for Rooppur, and also for other locations like Chittagong and Khulna, Dr. Matin points out.

In addition to the Russian, Chinese, and South Korean interest in the Rooppur plant, in May 2008, Pakistan's High Commissioner to Bangladesh, Alamgir Babar, told the Bangladesh authorities that that his country was also ready to share the technology for civilian purposes to help tackle the great energy crisis that Bangladesh faces.

Babar said that Pakistan has a program for nuclear energy already in place. It is going ahead with it; so it is now up to Bangladesh to decide what it actually wants. He said discussions over the matter could take place within the parameters of the Nuclear Non-Proliferation Treaty (NPT). Pakistan is not a party to the NPT, while Bangladesh is.

Many countries, including Britain, the United States, France, and Canada, had shown interest in the project when Bangladesh was still a part of Pakistan. Following the War of Independence and the birth of Bangladesh, India seemed keen to participate, but for unknown reasons, New Delhi never followed through.