

## From New Delhi by Susan Maitra

### Ten gigawatts of nuclear power by 2000

*AEC chief Ramanna knocks down the "sacred cows" of India's anti-nuclear lobby.*

**D**r. Raja Ramanna, chairman of the Indian Atomic Energy Commission, launched a campaign for nuclear energy here in a two-part series of public lectures in mid-January, asserting that the exploitation of nuclear power was an "inevitable" necessity if India is to continue developing as a modern nation.

When he presented the latest cost comparison between nuclear and coal, showing that nuclear power is competitive, even at the pithead, he demolished the last "sacred cow" of the coal lobby, which has been a hefty block to more rapid nuclear development.

India's power plan calls for the installation of 10,000 MW of nuclear generating capacity by the year 2000, or 10 percent of the country's total electrical supply. Given the enormous logistical and environmental problems associated with thermal power generation—principally low-quality coal-based—and the natural limitations on hydroelectric generation in this power-starved country, nuclear energy is essential. With a population of 780 million and a growing industrial base, India presently has only 30 gigawatts of power.

Dr. Ramanna stated his aim to clear up the misunderstandings surrounding nuclear power in India. The Tarapur experience created confusion and opened the door for a range of spurious attacks on nuclear technology.

In fact, as Ramanna explained, India has mastered the complete nuclear technology fuel cycle quite effectively, in conformance with the long-term program chalked out by Dr. Homi

Bhabha and adopted by the post-Independence Nehru government. Based on India's limited uranium deposits and more abundant thorium, that strategy is to first use natural uranium with heavy-water reactors followed by fast breeder reactors, which in their second generation will use thorium fuel.

A fast breeder test reactor will be commissioned this year, and work is already under way on preliminary design of a prototype fast breeder reactor for commercial production. The Indian fast breeder will operate on a new kind of carbide fuel developed by Bhabha Atomic Research Center (BARC) scientists.

Difficulties with the Tarapur light-water reactor, Ramanna pointed out, have no bearing on the basic nuclear power program, which is not based on light-water reactors and the associated enriched fuel cycle. Tarapur has in any case been functioning well for many years, he noted, and now that BARC scientists have developed an alternative mixed-oxide fuel, any future cut-off of fuel supplies will not close the plant.

Tarapur's difficulties have been largely political, not technical. Ramanna delivered a searing denunciation of current controls on nuclear technology transfer, echoing Prime Minister Indira Gandhi's recent condemnation of the "bogey" of nuclear non-proliferation. Today, Ramanna explained, it is impossible for India to import even nuts and bolts for a nuclear plant! The point was underscored by an announcement a few days after Ramanna's talk: The U.S. International Trade Administration has moved

to shut down a Seattle company which has been exporting radiation-shielding glass windows to BARC for 20 years, on the grounds of "very significant nuclear proliferation concerns."

The most dramatic new information the AEC chief provided was documentation that at 1977 capital costs, nuclear and coal-based energy generation were comparable. A comparison of the cost of electricity from nuclear power, coal-fired thermal power at the pithead, and coal-fired thermal plants at 800 km from the pithead is striking—at 5, 5.3 and 6.2 cents per kilowatt hour respectively.

Investment in the nuclear program had already begun paying off, Ramanna said, and with the construction of more plants their cost and construction time would decrease. He put the 10,000-MW program's break-even point at the year 1996.

A measure of the government's determination to follow through with the nuclear power commitment was Ramanna's announcement that he would convene a February meeting in Madras of Indian industrial leaders to mobilize their involvement in the program. For the first time, they will be assured of repeat orders for reactors and components to justify their development costs. Current projections call for an additional 5,000 MW of power from existing 235-MW reactor designs, and the balance from 500-MW units now under design development—in all more than 30 units over the next two decades.

In concluding remarks, Dr. V. S. Arunachalam, the Secretary for Defense Research Development and Science Adviser to the Minister of Defense, recalled that India had missed the first industrial revolution because the country was not free, and warned that today's unfolding industrial revolution dare not be sacrificed.