Column

Captive Power Plant at Neemrana Industrial Park

Development of Industrial Infrastructure through Public-private Partnerships between Japanese Companies and the Governments of India and Japan

Even during the current economic downturn, India is expected to experience GDP (gross domestic product) growth of around 7% in real terms. With over 50% of its 1.1 billion population below the age of 25, it is one of the few major growth markets in the world. The most important issue for its medium to long term economic growth is the development of its manufacturing sector and this is the motivation behind the plans for the DMIC which use Japan's Tokai industrial belt as a model. However, India is very different from Japan in respect to the state of its industrial infrastructure and it is necessary to construct an Indian model. The keyword is PPP. Hitachi's India Business Support Centre is now working to establish a power supply company at the NIP in the DMIC that will contribute to developing the necessary industrial infrastructure. This is being done in cooperation with the Japanese companies that plan to set up operations at the NIP and with the support of the Indian and Japanese governments.

MEGA-PROJECT ESTABLISHED BY INDO-JAPANESE ECONOMIC COOPERATION

THE NH8 (National Highway 8) connects the 1,500-km distance from Delhi to Mumbai, passing through Jaipur and Ahmedabad. The highway forms the main axis of the DMIC (Delhi-Mumbai Industrial Corridor) and is the country's most prominent transport route (see Fig. 1). The corridor will be the location for the construction of a high-speed freight corridor along with the development of highways and a natural gas pipeline. The 10 trillion yen project will cross six states and 24 industrial areas. The Japanese government is giving its full support to the DMIC project and tied loans of about 450 billion yen were finalized in October 2008 at a heads-of-government meeting between prime ministers Dr. Manmohan Singh and Mr. Taro Aso. The NIP (Neemrana Industrial Park) is about 2.5 hours by car from Delhi on the NH8.

In India, it is difficult to secure and procure industrial land. However, JETRO (Japan External Trade Organization) has partnered with the Rajasthan state government to set up India's first industrial park exclusively for Japanese companies with an arrangement that also includes tax and other incentives. As of August 2009, 17 companies had decided to establish operations at the NIP. Two have already stared production and seven have plants under construction (see Fig. 2). Looking out over the construction activity taking place across the five million square meters of the industrial park gives one a feeling for India's growth, future, and potential energy.

Fig. 1—India's National Highway 8.

Fig. 2—Construction in Progress at Neemrana Industrial Park in Delhi-Mumbai Industrial Corridor.

INADEQUATE INDUSTRIAL INFRASTRUCTURE AND CHRONIC POWER SHORTAGES AT INDUSTRIAL PARK

Unfortunately the NIP too suffers from the inadequacy of key industrial lifelines. These include power and water shortages and problems with the logistics infrastructure.

In terms of electric power, demand of 109 GW in India is matched by supply of only 91 GW meaning the country faces a shortage of 17%. Although the government planned 41 GW of additional capacity in its 2002 to 2007 five-year plan in the hope of overcoming the deepening electricity shortage, it could achieve only 22 GW (approximately 54%) and the gap between supply and demand continues to worsen. The current five-year plan (2007-2012) set a target of 78.5 GW of additional capacity but there are already reports that actual achievement will fall short of this objective by at least 20%. As a result, even Neemrana suffers from several power outages every month, some lasting up to six hours and occurring without prior notice. In response, many of the Indian companies in the neighborhood have resorted to using permanent diesel generators to generate their own power despite the high cost. A well is also being dug to draw groundwater to meet requirements for freshwater. However, rainwater harvesting restrictions limit the water uptake to the amount of annual rainfall and any shortfall has to be purchased from external sources. Wastewater disposal is also subject to strict regulations. On top of this, valuable water needs to be used to cool the generators.

USE OF H-25 GAS TURBINE AT SHARED ENERGY CENTER

Hitachi's India Business Support Centre (IBSC) has been working actively since July 2008 to find a solution to these problems. The initial investigations looked into the various problems experienced during construction by Nissin Brake India Pvt Ltd. and Mitsui Prime Advanced Composites India, two of the first companies to start work at the site. A committee of the 11 companies planning to set up at the NIP site was constituted and various issues were studied such as each company's forecast annual power demand, the actual power supply situation at neighboring Indian companies, Rajasthan state government rules and regulations, and GAIL (India) Limited's plans for a gas pipeline. In January 2009, the Basic Plan for a Shared Energy Center was formulated in conjunction with the Total Solutions Division of Hitachi, Ltd. to install a gas turbine to meet the demand for electric power from the Japanese companies at the NIP site. As a result of this project receiving recognition as a DMIC Early Bird project by the governments of India and Japan in October 2008, the project went ahead very smoothly with cooperation from the Japanese Embassy, Ministry of Economy, Trade and Industry, JETRO, New Energy and Industrial Technology Development Organization (NEDO), Japan Bank for International Cooperation (JBIC), the Indian government's Department of Industrial Policy Promotion, and the government of Rajasthan. An economic assessment of the Basic Plan found gas turbine generation could reduce the cost of electricity by 40% compared to the existing diesel generators (from Rs.10 per kWh to Rs.6 per kWh). The plan would also deliver environment benefits including avoiding the need for water cooling and elimination of SO*x* (sulfur oxides).

NEW CHALLENGES FACED IN IMPLEMENTING PLAN

Unfortunately the financial crisis that hit first in the USA from September 2008 has continued to have adverse effects, and with nine of the 11 companies coming from the automotive sector, the plan has been shaken at its roots. With each company adjusting its forecasts downwards and the initial version of the Captive Power Plant scheme requiring each user to make an up-front investment of 17% or more of the capital cost, the high initial investment requirement became

a major impediment. The business scheme was therefore modified to create an SPV (special purpose vehicle) that would require a collective investment from the users of 26% or more of the total capital requirements. Also, low utilization due to the excess capacity in both the number of units and total capacity of diesel generators that had been installed at the various companies in response to earlier forecasts of sharply rising demand meant that the actual generation cost far exceeded the figure of Rs.10 per kWh that the companies has used in their business plans. As a first step in resolving this situation, a PPP (public-private partnership) business entity has been established to supply electricity by operating the existing diesel generation capacity jointly through close cooperation between the companies that have already established operations. This will be followed by a second stage in which an H-25 gas turbine generator will be installed once demand exceeds 20 MW. This two-stage plan is now being put in place (see Fig. 3). Once this Shared Energy Center is established, it will provide a cheap and reliable supply of electric power to companies in the region. The Neemrana Shared Energy Centre model can then be replicated across other industrial parks in the DMIC and will become a model for developing countries.

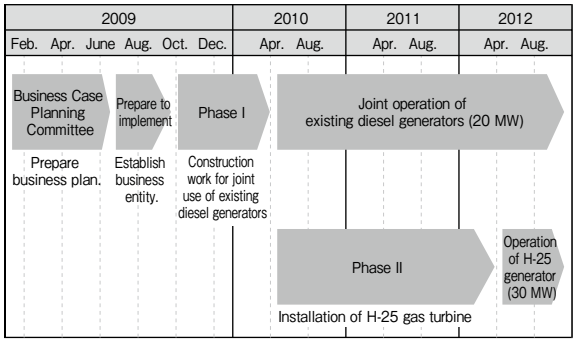

Fig. 3—Proposed Project Schedule.

INTEREST IN PROJECT

Interest in the Neemrana project is increasing exponentially. In early June, the Hindustan Times (the leading English daily in New Delhi) carried an article on how the Shared Energy Center in Neemrana could become a model to encourage more PPPs. This was followed in the same month by a visit from JBIC's CEO (chief executive officer). In July, the visiting DMIC task force from Japan was updated on the status of the project and the Secretary of the Indian government's Department of Industrial Policy and Promotion promised continuing support. In early August, the project made front page news in an evening edition of The Nikkei, Japan's leading business paper. The newspaper also invited Hitachi to make a panel presentation at their World Environment Business Forum in early September, which is to be led in Delhi by Nobel laureate Dr. Pachauri.

CONCLUSIONS

There are many other issues such as waste water treatment and logistics where Hitachi can contribute and there is strong underlying demand for infrastructure solutions. IBSC needs to become even more active in order to develop this market.

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