



its associated surge shaft and chamber to the penstocks where it drips almost straight down for a distance of 2,500 feet into the power house (also underground). After passing through the turbines the water passes through the tailrace tunnel to the tailrace channel and thence is discharged into a nearby river. The concept and design of the engineering structures are bold and novel. The Cheruthoni Dam is the largest and highest concrete gravity dam in Kerala. It is 454 ft. high and finds a place among the first hundred high dams in the world. The spillway for the Idukki reservoir formed by the three dams is located in the Cheruthoni Dam and will be controlled by 5 large radial crest gates (40' × 34').

The Kulamavu dam was designed as the highest rubble masonry gravity dam in Kerala. It is 328 feet high. The power tunnel intake is of the glory hole type and is the first of its kind in Kerala and second in India. The intake leads the water, regulated in the reservoir to a horse shoe-shaped tunnel of 23' diameter which ends in an underground surge shaft based on a novel concept and design. The surge shaft is a restricted orifice type which is entirely underground with bottom and top expansion chambers and an inclined shaft rising to 255 feet above the tunnel invert.

The underground power house cavern is the largest in India; it measures 453' (long) × 65' (wide) × 113.5' (high). Access to the power house is through a road tunnel 2,000 feet long. Three giant generators, each of 130 MW capacity—manufactured by M/s Canadian General Electric Ltd., Canada — run by 1,80,000 H.P. pelton wheels, ranking among the largest three of its type in the world, are being installed in the power house during the first stage of the project. The turbines are supplied by M/s Neyrpic, Canada.

The 220 KV switch yard overground is connected to the power house by two cable tunnels which accommodate the large oil filled power cables.

The energy generated at Idukki is transmitted over a double-circuit, 220 KV line to the Kalamassery Load Despatch Station. A single-circuit, 220 KV

line connects Idukki to Pallom and another single circuit, 220 KV line connects Idukki to Mysore. The Idukki-Mysore transmission line when completed will be the largest longest high-voltage transmission line in Kerala.

The tailrace system comprises a 4,000 feet-long tunnel, a tailrace channel passing below the mountain stream "Nachar"—taken care of by a concrete super passage—and a by pass channel leading to Valiar, a tributary of the Thodupuzha River, and will be utilised for irrigation and industrial purposes in the Muvattupuzha Valley. The entire water conductor system commencing from power tunnel intake up to the end of tailrace is designed for 5,400 cusecs discharge equivalent to the maximum capacity of six generating sets.

Idukki First Stage would generate over 2,300 million units of energy annually. This bulk additional power to the southern grid will be a blessing to the people of Kerala, Tamil Nadu and Karnataka. The annual power generation will be worth over Rs. 20 crores. The project with a large energy storage and a large intake capacity, is designed to serve as a peaking station. On the completion of first stage, the minimum rail race discharge would be of the order of 1,000 cusecs and this regular flow in the Muvattupuzha river will be utilised for development of industries requiring large amounts of water.

The Canadian aid to Idukki is one of the "softest" obtained by India.

The project, as Mr. Maybee pointed out, is not an isolated incident of Indo-Canadian cooperation in the field of power development. "Many years ago we participated in the construction of the Mayurakshi Project in West Bengal and Bihar which was built during the First Five-Year Plan. We took part at Umtru in Assam, at the Chambal Valley development in Rajasthan and Madhya Pradesh, and we are still involved with the Kundal Hydro-Electric Project in Tamil Nadu. Our countries are both in the process of developing hydro-electric resources as key elements in our economies, so this cooperation is a natural and important part of the relations between our two countries."

Canadian involvement in Kerala has

been long and durable. Perhaps this is because both the words rhyme well. Perhaps it is because the first ever major Canadian industrial venture in India was in this State. I refer to the Indian Aluminium Company's smelter at Alway which made India's first aluminium ingot way back in 1942. India's first ever zinc ingot also rolled out of an Indo-Canadian industrial project, the Cominco Binani zinc smelter which is also located in the same city. Both these companies, I am sure, are an important part of Kerala's industrial community and certainly will be among the principal customers of the power that Idukki will produce."

"This," Mr. Maybee added, "is also a time for praise for those who have been involved in this project. I am thinking of the many ministers and officials of the Kerala State Government, of the hard work of the executives, planners and organisers engineers and other technical personnel of the Kerala State Electricity Board, and of the thousands of workers who have laboured to bring this project to the stage that we see today. It is perhaps not entirely appropriate for me to mention my own countrymen who have worked on his project, but I would be remiss if I did not say that Canadians are proud of what they have done here. The Canadian consulting engineers, SNB, have been working on this project since 1963. I pay tribute to them and to the many other Canadian companies and their personnel who have had a part in Idukki."

In February 1968 the then Canadian High Commissioner to India, Mr. James George took part in the inauguration of the Idukki and Cheruthoni Dam Works. Throughout his appointment in India Mr. George maintained a close and personal interest in Idukki's development. He has asked me to send you his congratulations on this auspicious occasion," said Mr. Maybee.

"My government and the people of Canada would, I think, like to regard Idukki as yet another symbol of happy and successful Indo-Canadian cooperation." Mr. Maybee added, "On their behalf I extend congratulations to Kerala and to India on the achievement of Idukki, and good wishes for the work which lies ahead."