

Valley of power

By Hiranthi Fernando

The largest mini hydro power project to date in Sri Lanka was commissioned in June this year at Carolina Estate in Watawala. The 2.6 MW project has the capacity to generate an average of 16 million kilowatt hours of electricity a year.

Registered as Mark Marine Services (Pvt) Ltd., (MMSPL), the project with a total cost of Rs.230 million, was jointly promoted by Mark Marine Services (MMS) and CF Venture Fund Ltd. The hydro power generated by MMSPL is sold to the national grid through the Ceylon Electricity Board (CEB).

Located in a valley beside a tributary of the Mahaweli river, the powerhouse is reached by a newly cut track winding steeply downhill from the main Ginigathena - Hatten Road, about a kilometre from Watawala. The powerhouse is on five acres of land on Carolina Estate, obtained on a 30 year lease, renewable for another 30 years. The waterway is tapped at a point further upstream. The stream is dammed and water is diverted through an open concrete channel to three pipes or penstocks laid from the road level down to the powerhouse. The total head height of the site is 97 metres.

The powerhouse is equipped with three identical machines fitted with a turbine and a generator. The water flows to the turbines with great force because of the steep gradient. The water turns the turbines, which in turn work the generators. Chairman of the company Anil Makalanda, said the turbines were purchased from a 190-year-old British company named Gilbert, Gilkes and Gordon, which had sold over 400 turbines to Sri Lanka between 1890 and 1960. "They are back in Sri Lanka again since the Government is deciding to buy power from the private sector," he said.

Powerhouse Manager, Upendra Yatawaka explained how the power is sent through the controlling panels located on a gallery above the machines, along one side of the powerhouse. "The entire power station is fully computerised and controlled by these units," Mr. Yatawaka said. "These machines can be operated by one person pushing one button. It is a 24-hour operation. However, if there is a power failure in the national grid we have to stop producing. When power fails in the national grid, the machines are automatically shut down."

The head level indicator panel indicates the height of water in the channel and automatically adjusts the capacity of the machines. The computer panel gives information on the present production, temperatures and so on. Failures and breakdowns are registered automatically.

The power, which is generated in the powerhouse, goes to the switch yard with three transformers to step up the voltage. The power is metered and sent through six towers to the main grid, which is about 1.2 km away. A standby generator ensures that the computer continues to work when the grid fails.

Having generated power, the water gushes out of the powerhouse in full force and flows back to the stream. Managing Director, Gihan Makalanda explained that the stream is tapped at midlevel, goes through the powerhouse and flows back to the stream. "We also ensure that the stream is kept clean, by removing all plastic bags and other debris," he said. "Not a drop of water is wasted," commented Sam de Silva, another director of the company.

Mr. Makalanda further explained that when power fails, the water in the channel is not sent through to the powerhouse. As the trip goes, the water is let out from a point in the channel, which is slightly lower. It flows down the mountain over bedrock forming a waterfall, into the stream at the bottom. This occurs at least once a day on an average. Further to the left is another rocky patch over which a small stream of water was flowing. This was the path taken by the stream originally before it was diverted for the hydropower project. At the site where the stream is dammed, a large pipe has been fitted to send out some water over the rocky path so that the waterfall is not deprived of water completely. A gate in the channel is also kept partially closed to allow some water out.

When the dam was being constructed, it had been discovered that a generator had been built at the same location during British colonial times. Some remnants of this generator were unearthed close to the stream.

A positive factor in this project is that it appears to be clean and environmentally friendly. No smoky fumes are discharged into the air, nor messy byproducts dumped into the stream. "The first thing we did was to get the environmental clearances," Mr. Makalanda said. There were certain stipulations made, which were complied with. The vegetation had to be brought back to normal. Some repair work had to be done to the mountainsides to cover the scars made by the construction. Trees were planted. A small amount of water has to be released to the waterfall to maintain the fauna and flora, particularly during the dry season. During the rainy season, he said there will be no problem because there is an excess of water, which flows over the dam anyway.

Mr. Makalanda said that according to a World Bank study the potential capacity for mini hydropower, to be harnessed in the country totals around 300 to 350 megawatts. If this hydro power was harnessed it is expected to have a power generation capacity one and a half times that of the Victoria Project.

The Mark Marine Hydropower project employs about 40 people from the area. The roadway and the gardens are still being done. During the construction stage, over 200 workers from the area were employed. They also maintain a good relationship with the villagers around, assisting them with transport.

"Where the Ceylon Electricity Board (CEB) is concerned, they have been encouraging and cooperative every step of the way. We are working with them in establishing a capacity charge," Mr. Makalanda said.

Although construction and transport of material to the site down the steep slope had been haz-

Nestled in a valley besides a tributary of the Mahaweli in Watawala, this new mini hydro power project can generate 16 million kilowatt hours of electricity a year

ardous, he said by maintaining strict safety regulations, they avoided major mishaps. He recalled that on the day the project was commissioned, the tractor and trailer carrying debris from the construction, had tipped over into the channel. "Amazingly, no one was seriously injured."

Director and Chief Executive Officer of CF Venture Fund Ltd. Samantha Rajapaksa, said that necessary environmental clearances had been obtained for the project. He said the waterfall that has been affected is not a well known or registered waterfall. It is a cascading fall flowing down to the stream. He added that they are sending more than the amount of water specified by the Central Environmental Authority, to the waterfall so that the ecology of the area is being maintained. "At a time when the country is facing a power crisis, it is important to look at sources of renewable energy," Mr. Rajapaksa said. "Even though the cost may be somewhat higher, other countries are paying a premium for this type of energy. Sri Lanka is not giving much concentration to renewable sources of energy such as hydropower, wind and solar power."

