

# Salleri-Chialsa Electric Company - Experience of a New Approach to MMHP Management

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## Introduction

This paper highlights the approaches to and activities of the Salleri-Chialsa Mini-Hydroelectric Project in making MMHP viable through participatory management. The Salleri-Chialsa hydropower station and its supply area are located in the Salleri and the Garma Village Development Committees in the Solukhumbu district of eastern Nepal. This power plant was commissioned in 1985 through the Swiss Aid Project. Subsequently, the governments of Nepal and Switzerland decided to manage the Salleri-Chialsa Plant in a non-traditional manner in order to address the problems of high operating costs, poor availability of plant and supply systems, inefficient management, unproductive use of electric power, and the low socioeconomic benefits derived from isolated mini-hydropower systems in Nepal. The ultimate outcome was the establishment of a shareholder public limited company under the name of Salleri Chialsa Electric Company (SCECO).

## The Company

SCECO was registered with the Ministry of Industry in February 1991 as a shareholder company with preference (investment) shares held by the Nepal Electricity Authority (NEA) — 31.5 per cent and the Swiss Development Cooperation (SDC) — 31.5 per cent and ordinary shares held by householders (consumers only) — 37 per cent. The Board of Directors has three members; one each from NEA, SDC, and the local community. The company is run by a total of ten employees only.

## The Plant and Electrical System

The power plant is a 400kW run-of-the-river scheme housed with two cross-flow turbines. The electrical supply system consists of 20km of 11kV overhead transmission line, 50km of 220V underground distribution cable and 1,150kW of total installed transformer capacity. From each transformer, a distribution line is connected to the Main Distribution Box (MDB) and then to the Sub-Distribution Box (SDB). At each SDB, Load Controlling Switches (LCS) are installed. With the help of the LCS and the Miniature Circuit Breaker, the load to each customer is controlled. In case of an overload or a short circuit, the LCS of the corresponding customer is tripped and the customer is temporarily disconnected.

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## Management Aspects

*Tariff:* The SCECO tariff system for 1994/95 is presented in Table 1. Introduction of peak power limits for industrial consumers and two levels of unmetered domestic consumers distinguish this tariff structure from the NEA tariff structure.

**Table 1 : SCECO Tariff for 1994/95**

Consumer Type	Level	Admitted Maximum Power, kW	Minimum Charge NRs/ Month	Exempted, KWh	Additional consumption		
					First Slab		Second Slab
					Limit kWh	Rate NRs/kWh	Rate NRs/kWh
Domestic Sector	1	0.1	70	all	-	-	-
	2	0.5	250	all	-	-	-
	3	2.0	300	70	90	4.2	2.0
Service Sector	4/1	4.0	550	75	90	4.2	2.0
	4/2	8.0	945	75	95	4.2	2.0
Industrial Sector	5/1	Off Peak	300	50	85	2.0	1.5
		Peak					
	5/2	> 10.0	0.5	405	75	85	2.0
5/3	> 10.0	2.0	700	120	90	2.0	1.5

Billing is computerised, which has made billing quick, efficient, and error-free.

### Other Indicators

Some indicators that show the overall plant performance are presented in Table 2.

**Table 2 : Plant Performance Indicators, 1993/94**

Losses (%)	Plant Availability (%)	Station Factor (%)	Load Factor (%)	Specific Revenue NRs/kWh
8.1	98.7	30.0	43.8	2.07

The above indicators show that the performance of this plant is the best among all the MMHP plants in Nepal. Therefore, there is much to be learned from this plant in terms of management.

### Operation and Maintenance

The technical officer has been trained by the equipment manufacturers, and, therefore, is competent in operating the plant. He has the capability of conducting fault analyses, of replacing faulty parts, and of ordering spare parts with exact and correct specifications. The damaged parts are replaced and not repaired. Lubrication, oil replacement, and inspection of equipment are carried out regularly as per the

recommendations of the manufacturers. Annual maintenance is also carried out, for which the plant is shut down for a week. During this period, necessary refurbishment work is completed. To avoid accidents and damage to the equipment, safety measures are constantly taken.

### *People's Participation and Customer Information*

For smooth information flow between the people and SCECO, *ad hoc* committees have been formed in all the supply areas. In these committees, effective use of electricity, company standards and policies, safety measures, and other matters are discussed. This sort of close and open relationship has made implementation of new decisions more easily acceptable. Each customer is privy to information on technical and financial matters.

### Within SCECO

Weekly meetings at the executive level and fortnightly meetings at the technical level are held for information exchange, decision-making on new plans, identification/improvement of work and review of progress, preparation of weekly plans of action, and so on. A weekly work schedule for the operators is also formulated at the meeting. This prepares the operators psychologically for the work to be performed in the coming week. A communication set (walkie-talkie) with each of the operators and the installation of a Local Area Network (LAN) in all the computers at the headquarters have made quick exchange of information between plant personnel possible. It is interesting to note that in 1993/94, 40 per cent of the total expenditure was allocated for depreciation.

### **Conclusions**

Innovative management approaches have helped SCECO achieve the highest standard of plant performance in the mini range. This experience is worth analysing in depth.