

MONITORING REPORT

“Lohgarh, Chakbhai and Sidhana Mini Hydroelectric Projects”

Aqua Power Limited

Reference No.UNFCCC00000327 - CDMP

Project Site:

**Bhatinda Branch Canal, District Sangrur,
Punjab, India”**

M/s Aqua Power Limited

B-37, Sector-1

Noida – 201301

Uttar Pradesh, India

Fax No. 91-0120-2443723

Current Status of the Project

There Mini Hydroelectric Power projects aggregating to 5.20 MW at Lohgarh, Chakbhai and Sidhana on the Bhatinda Branch canal, District Sangrur, Punjab, India are being set-up. Mini Hydroelectric project at Lohgarh (2MW) was commissioned in October 2005 and at Chakbhai (2MW) was commissioned in November 2004. The plants are operating successfully. The Mini Hydroelectric project at Sidhana (1.2MW) is under construction. The contract for supply and commissioning for all equipment for the projects was given to reputed contractors as under:

S.No.	MHP	Equipment	Qty	Supplier
1	Lohgarh	Turbine & its accessories	2	Boving Fouress Limited, Bangalore
		Induction Generator	2	
2	Chakbhai	Turbine & its accessories	2	Boving Fouress Limited, Bangalore
		Induction Generator	2	
3	Sidhana	Turbine & its accessories	1	Boving Fouress Limited, Bangalore
		Induction Generator	1	

The Company provided the entire equity and loan was taken from consortium of banks viz. Canara Bank, UTI Bank and Corporation Bank.

**Statement to What Extent the Project has been
Implemented as Planned**

The projects were completed as planned and described in the Project Design Document (PDD).

One of the schemes at Lohgarh (2MW) is in operation continuously (with outages – forced & planned) since October 2005, Chakbhai (2MW) is in operation since November 2004 and Sidhana (1.2MW) is in the advance stages of construction. The purpose of the projects is to generate electricity by utilizing water flowing through the existing canal system.

Monitoring Period

The monitoring period is from 20.11.2004 to 31.03.2006 (Both days included)

Sustainability – Economic and Social Well-being

The project activity has resulted in sustainable development in the region as follows:

1. Generating clean power by utilizing water would help in eliminating an equivalent carbon dioxide, sulphur dioxide, nitrogen oxides, SPM *etc.* which would have been otherwise generated to produce electricity.
2. Power generation from a renewable source like water has helped to substitute & conserve considerable amount of finite, non-renewable energy resource (coal & natural gas).
3. Project activity has resulted in creation of direct and in-direct employment in the vicinity.
4. Additional economic benefits have accrued by creation of business opportunity for local stakeholders such as villagers, local shop owners, small contractors, school, hospitals, etc.
5. Project Area has been lighted with road reflectors and flash lights 24 hours a day which has provided security for the local people commuting in odd hours.
6. Project activity helped in reducing the demand-supply gap in the power deficit state grid.
7. Helped in Up-gradation of old rural grids and strengthening of country's rural electrification coverage.
8. Helped in strengthening of existing irrigation canals, bridges, roads by u-gradation of these structures.
9. Mechanical Trash racks and trash cleaning machines helped remove trash in the canal resulting in flow of clean water in the canal for irrigation and drinking purposes.
10. Project activity serves a small demonstrative project for clean renewable energy generation in the state. (As these projects are being the first private sector small hydropower projects in the state)
11. Project activity would also contribute to the state exchequer.

Obtained Parameters According to Monitoring Plan

For the project, following parameters were monitored on a continuous basis.

Energy:

- i. Electronic energy meters were installed for measuring the gross power generation (export) as well as auxiliary power consumption (import) at the grid interconnection point for all 3 schemes.
- ii. Hourly data recording of the relevant parameters and also the recording of total energy generated for every 8 (eight) hours shift.
- iii. Daily readings were aggregated to monthly readings.
- iv. Monthly reports stating the gross auxiliary and net energy exported were prepared by shift-in-charge and verified by plant managers.
- v. Monthly joint meter readings are taken at interconnection point and certified by representatives of APL and the purchaser i.e. Punjab State Electricity Board (PSEB).
- vi. The joint meter readings are used to raise invoice for sale of net energy to PSEB.
- vii. The finance department cross checks the data provided by plant managers.

Month-wise data on net energy exported is given below:

S. No.	Month	Year	Net Power Exported (kwh)			
			Lohgarh	Chakbhai	Sidhana	Total
1	November	2004	0	83360	0	83360
2	December	2004	0	661770	0	661770
3	January	2005	0	689300	0	689300
4	February	2005	0	156000	0	156000
5	March	2005	0	537940	0	537940
6	April	2005	0	866430	0	866430
7	May	2005	0	1038270	0	1038270

8	June	2005	0	1144190	0	1144190
9	July	2005	0	984890	0	984890
10	August	2005	0	1309580	0	1309580
11	September	2005	0	449790	0	449790
12	October	2005	459340	916440	0	1375780
13	November	2005	627310	820540	0	1447850
14	December	2005	1030840	1288220	0	2319060
15	January	2006	1079280	1298060	0	2377340
16	February	2006	995330	1202040	0	2197370
17	March	2006	386490	477890	0	864380
	TOTAL		4578590	13924710	0	18503300

Emission Reductions

Baseline Emissions:

Carbon Emission Factor as per the baseline adopted (kg CO₂/kWh) – 0.942

Net energy exported (kWh) – 18503300

Baseline emissions (ton CO₂) – 17430

Project Emissions: NIL

Emission Reductions:

Baseline emissions – Project emissions

= 17430 - NIL

= 17430

Measures to Ensure the Results/Uncertainty Analysis

The energy exported by each project of Aqua Power Limited (APL) was recorded from one independent main meter installed at the switchyard area of the respective project. Energy export and import given by main meter was used for arriving at the figures of net power exported.

In the event, the main meter is not in operation, then reading from a check meter installed at the grid substation of PSEB is used for raising the energy invoice. Till date the main meter only has been used for billing purposes.

The uncertainty level of the net energy exported by project activity is low. In the event, the main meter is not in operation, the project activity has provision of taking the reading from a check meter installed at the grid substation of PSEB, which would be further used for raising the energy invoice. However, till date the main meter only has been used for billing purposes.

The accuracy level of both the main and the check meter is high. The meters are electronic bidirectional trivector meters of accuracy class 0.5 with maximum uncertainty of $\pm 0.5\%$. These meters have been installed in a temper proof strong steel compartment sealed at every open end. These compartments are again being kept under a completely closed & locked Meter Room made of RCC. The area where the meter room is located is completely fenced and protected by a barbed wire.

At the time of installation of the meters, the accuracy and other parameters were checked thoroughly by the manufacturer i.e. L&T and a test report issued by L&T.

The accuracy of the meters gets automatically checked at the time of joint meter reading which is being taken every month by PSEB. Further, the meters are

being calibrated once in every six months by PSEB. PSEB officials visit the site and issue a challan in respect to the confirmation of the accuracy of the meters. The date of calibration and signature of PSEB official is indicated on the challan. These challans are laminated by a cellophane material and pasted as a seal on to the Meter Box itself.

In the event, PSEB official observes any fault in the meter, then the same is being replaced by the official and a spare tested meter is installed. The faulty meter is then sent to the Metering Equipment (ME) Laboratory, PSEB, Patiala wherein the same is tested and a test report is generated. The meter is again re-installed by the official at the site.

Roles and Responsibilities

APL was the sole agency responsible for implementation and monitoring plan given above.