

PATIKARI POWER PVT LTD

2 X 8 MW

Mandi District, Himachal Pradesh



Annual O&M Report

FY 2012-13

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1. Introduction

16 MW Patikari Project, implemented by Patikari Power Private Limited, is a run of the river hydro power project developed on Bakhli Khad, a tributary of Beas River and is located in Mandi district of Himachal Pradesh, India. Two (2) generating Units driven by horizontal shaft Pelton Turbines, each having a rated output of 8.0 MW (having 15% CMR), are installed in the Power Station. The Design Energy of the Power Plant is 78.81 million KWh of electrical energy based on the 90% Dependable Discharge and rated output of 16 MW.

Patikari HE Project harnesses energy of the water in Bakhli Khad River diverted through a Diversion Weir and led to Desilting Tanks. After flushing the silt, if any, clean water is then fed to the Water Conductor System comprising of 3.6 km Head Race Tunnel including two (2) Aquaducts enroute, followed by Surface Steel Surge Shaft and 715 m long Penstock feeding water under pressure for driving two (2) hydro-generating Units in the Power House. After passing through the Turbines, water is led back to Bakhli Khad through Tail Race Channel.

Each of the two (2) Generating Units in Patikari Hydropower station comprises horizontal Pelton Turbine to which synchronous Generator is directly coupled, generating rated power of 8.0 MW at 11kV. Besides appropriate Unit and Station Auxiliaries, state of the art Control and Monitoring System (SCADA) has been installed in the Power Station to ensure optimum generation there from.

Power so generated is then being stepped up to 33kV through two (2) 11MVA Step-up Transformers and evacuated through one (1) double circuit 11km long 33kV Transmission Line terminating at the other end in 33kV Substation of HPSEB at Pandoh which is part of the HPSEB network. Patikari Power Private Limited have entered into a long term Power Purchase Agreement dated 5th July 2004 with HPSEB envisaging delivery of power from the Project at 33kV Substation of the Board at Pandoh in Mandi district of Himachal Pradesh. Tariff for the electricity to be supplied by the Project to the Board at this Delivery Point is Rs. 2.25 per kWh (fixed).

Design Energy of the project, based on the 90% Dependable year Discharge as adopted in the Detailed Project Report and without taking into account mandatory release of 15% discharge during lean discharge period, is 78.81 MU. However, discharge trend in Bakhli Khad as actually observed since commissioning of the project, does not match with above said Design discharges especially during eight lean discharge months even in years with normal monsoon rains. As a result, actual annual energy generation from the Project till date has been less than that of the Design Energy even during years with normal monsoon rains and in spite of both the units having been run at around 15% overload during monsoon months.

2. Plant Performance

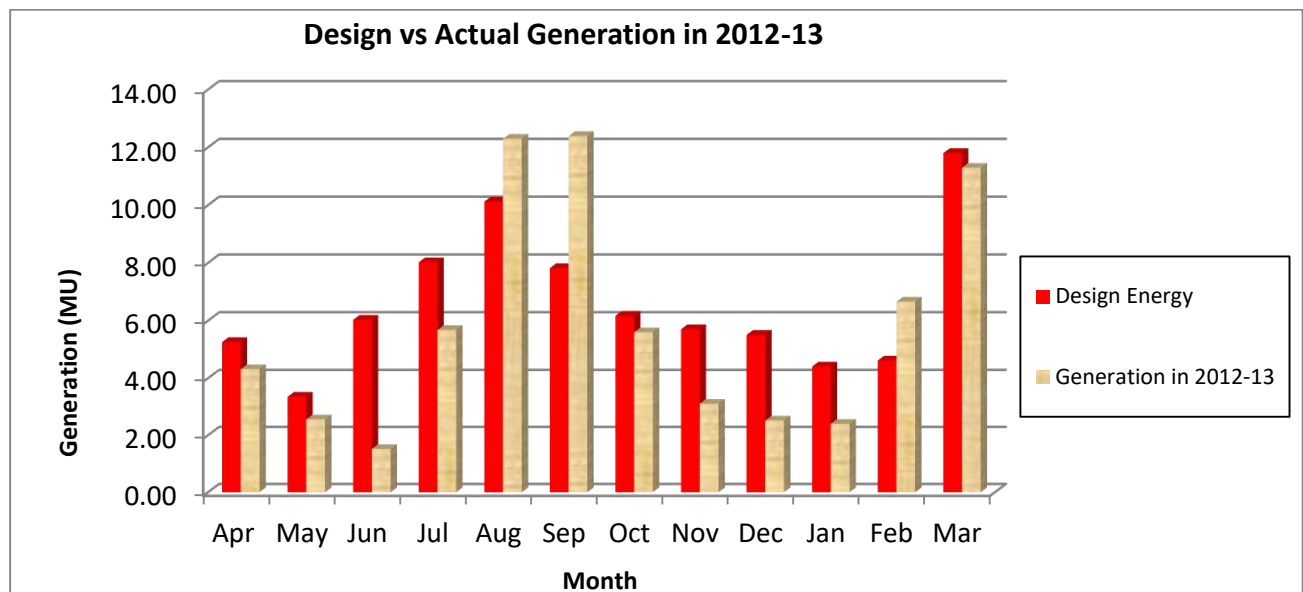
2.1 Generation Data during the Year:

Month wise Design Energy and corresponding actual generation from the Project during 2012-13 and reasons for variations between the two are tabulated hereunder.

Month	Design Energy (90% Dependable Year in MUs)	Actual Generation (MUs) during 2012-13	Actual Vs Design Energy (%)	Remarks
Apr	5.26	4.319	82.11	Due to low discharge
May	3.35	2.556	76.30	
Jun	6.03	1.517	25.16	
Jul	8.02	5.678	70.80	
Aug	10.12	12.296	121.50	
Sep	7.82	12.392	158.47	
Oct	6.17	5.598	90.73	Due to low discharge

Nov	5.70	3.104	54.46	
Dec	5.51	2.516	45.66	
Jan	4.41	2.399	54.40	
Feb	4.62	6.660	144.16	
Mar	11.80	11.292	95.69	Due to low discharge
Total	78.81	70.327	89.24	

As evident from above, against Design Energy of 78.81 MU based on 90% Dependable Year Discharges, Project generated 70.327 MU during the financial year 2012-13. The Generation during financial year 2012-13 was thus 89.24 % of the Design Energy.



2.2 Generation during five years of Operation since commissioning:

Month	Design Energy (90% DY in MUs)	Actual Gen. (MUs) during 2008-09	Actual Gen. (MUs) during 2009-10	Actual Gen. (MUs) during 2010-11	Actual Gen. (MUs) during 2011-12	Actual Gen. (MUs) during 2012-13
Apr	5.26	3.08	2.28	1.29	5.859	4.32
May	3.35	2.36	1.68	1.51	3.20	2.56
Jun	6.03	7.20	1.50	3.72	5.27	1.52
Jul	8.02	12.02	2.22	8.42	6.51	5.68
Aug	10.12	13.21	5.49	13.05	6.37	12.296
Sep	7.82	11.61	8.99	12.82	10.913	12.392
Oct	6.17	8.60	3.47	7.90	5.17	5.60
Nov	5.70	4.34	2.34	3.83	3.08	3.10
Dec	5.51	3.22	1.84	3.07	2.53	2.52
Jan	4.41	2.62	1.65	3.03	2.94	2.40
Feb	4.62	2.16	2.46	4.47	3.43	6.660
Mar	11.80	2.18	2.59	8.26	4.96	11.292
Total	78.81	72.60	36.52	71.36	60.23	70.327

Generation during the months of February and March 2013 were the highest recorded for these two months so far since commissioning of the Project.

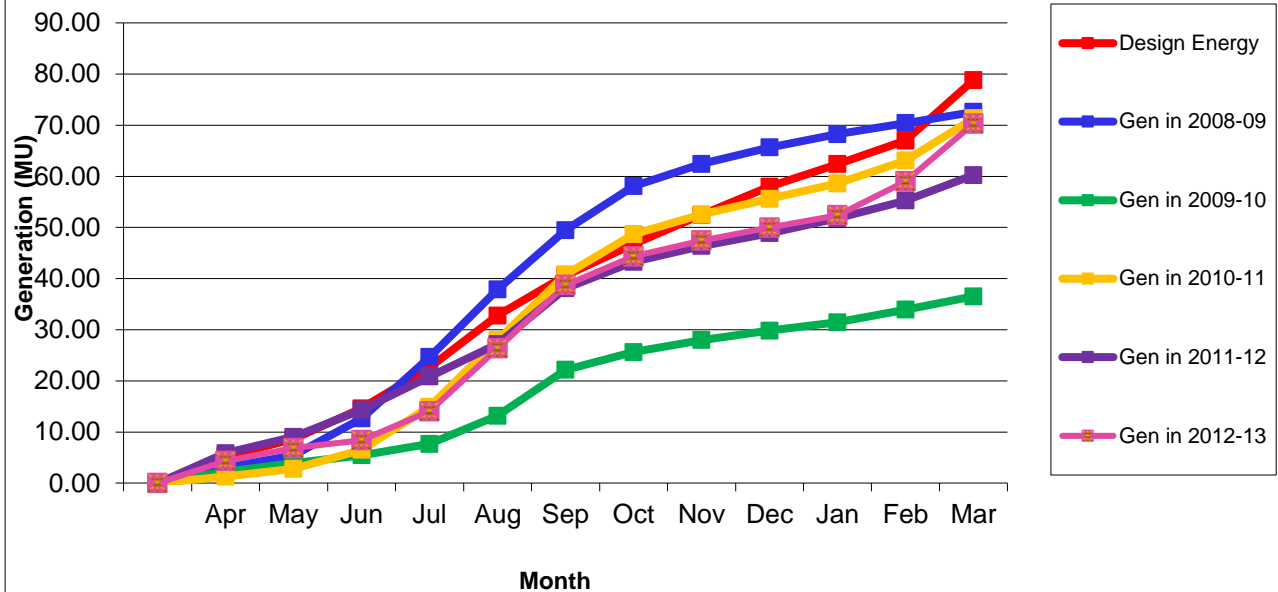
Quarter wise performance of the Plant during the year is tabulated hereunder:

Quarter	Design Energy (MU)	Actual Generation (MU)	Actual/Design Energy (%)
1st Quarter (April 12 to June 12)	14.64	8.39	57.31
2nd Quarter (July 12 to Sep 12)	25.96	30.37	116.99
3rd Quarter (Oct 12 to Dec 12)	17.38	11.22	64.56
4th Quarter (Jan 13 to Mar 13)	20.83	20.35	97.69
Total for the year 2012-13	78.81	70.33	89.24

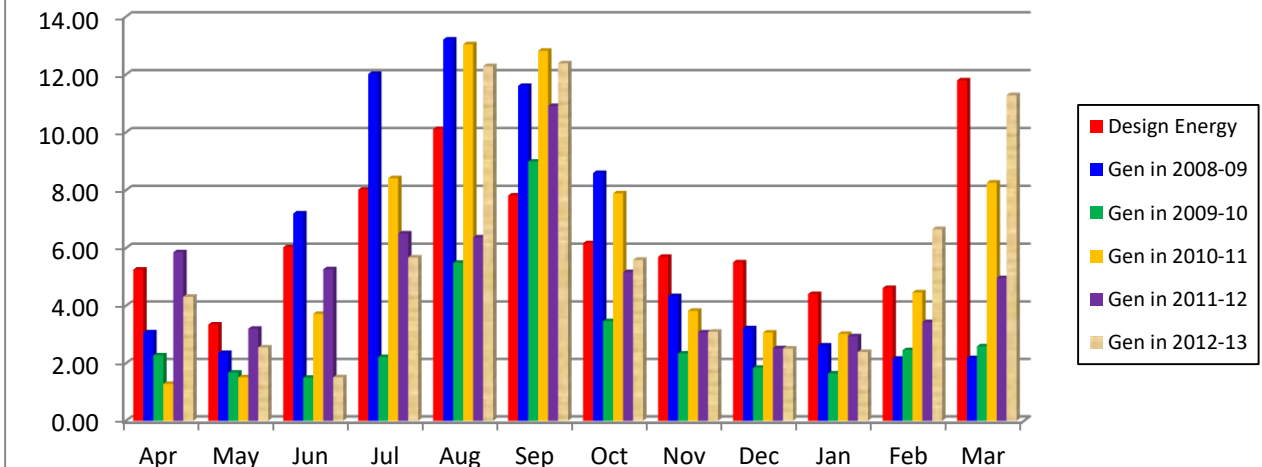
As is evident from above table, generation during 2nd and 4th quarters was above or near about the Design Energy but the generation during other two quarters was comparatively less because of poor river discharges during corresponding months.

Generation during the fourth quarter i.e. Jan-13 to Mar-13 was 20.35 MU i.e. 97.70 % of the Design Energy of 20.83 MU which is the highest achieved so far for this quarter since commissioning of the project.

Cumulative Generation at a Glance



Generation at a Glance



2.3 *Discharge actually observed in the Bakhli Khad after commissioning:*

Discharges actually observed in Bakhli Khad during lean discharge months after commissioning of the Project are much lower than the corresponding Design Discharges and many a times even less than the lowest monthly discharges recorded before commissioning as per DPR.

A comparison of discharges actually observed in Bakhli Khad after commissioning of the Project vis-a-vis Design and earlier lowest recorded monthly discharges from 1984-85 to 1995-96 taken into account in the DPR is given below.

Month	90% Dependable Year Discharge	Lowest Monthly Discharge Observed from 1984-85 to 1995-96	Actual Discharge during 2008-09	Actual Discharge during 2009-10	Actual Discharge during 2010-11	Actual Discharge during 2011-12	Actual Discharge during 2012-13
Discharge data is in cumecs							
Apr	2.45	1.79	1.80	1.12	0.69	2.87	2.29
May	1.52	1.29	1.03	0.76	0.76	1.60	1.25
Jun	2.81	1.23	4.84	0.74	2.40	3.52	0.78
July	6.15	3.47	5.98	1.02	5.34	6.73	2.95
Aug	4.56	4.56	8.01	3.03	12.55	10.05	15.12
Sep	3.65	3.65	5.90	6.32	9.44	6.65	7.84
Oct	2.79	2.70	3.72	1.54	3.67	2.43	2.62
Nov	2.66	1.77	2.08	1.15	1.87	1.55	1.58
Dec	2.49	1.43	1.48	0.88	1.49	1.25	1.31
Jan	1.99	1.16	1.25	0.82	1.48	1.53	1.25
Feb	2.26	0.89	1.15	1.28	2.44	1.78	3.74
Mar	6.46	1.20	1.07	1.18	3.87	2.44	5.57

2.4 Revenue Generation / Realization

Project delivered 6,03,98,976 Units of electricity to HPSEB during financial year 2012-13 after accounting for 12% Free Power to the Home State. Against the energy supplied and billed for the year 2012-13 amounting to INR 13,58,97,696/- HPSEB released payments amounting to INR 117,350,640/- including the payment for Feb & March-12 amounting to INR 6,705,072 & INR 9,651,312/- released during April & May-12. Details about the monthly billings and receipts are tabulated hereunder:

Financial Year 2012-13				
Revenue Generation/Realization during Financial Yr 2012-13				
S.No.	Period	Total Saleable Energy (kWh)	Bill Raised (INR)	Amount Received (INR)
1	-----	-----	-----	6,705,072*
2	-----	-----	-----	9,651,312*
3	01/04/12 to 01/05/12	3,759,360	8,458,560	8,458,560
4	01/05/12 to 01/06/12	2,134,176	4,801,896	4,801,896
5	01/06/12 to 01/07/12	1,303,104	2,931,984	2,931,984
6	01/07/12 to 01/08/13	5,037,120	11,333,520	11,333,520
7	01/08/12 to 01/09/12	10,483,968	23,588,928	23,588,928
8	01/09/12 to 01/10/12	10,487,136	23,596,056	23,596,056
9	01/10/12 to 01/11/12	4,764,672	10,720,512	10,720,512
10	01/11/12 to 01/12/12	2,675,904	6,020,784	6,020,784
11	01/12/12 to 01/01/13	2,164,800	4,870,800	4,870,800
12	01/01/13 to 01/02/13	2,076,096	4,671,216	4,671,216
13	01/02/13 to 01/03/13	5,831,232	13,120,272	-----**
14	01/03/13 to 01/04/13	9,681,408	21,783,168	-----**
	Total	60,398,976	135,897,696	117,350,640

- * Payments against energy bill of Feb & Mar-12 (Rs. 6,705,072 & Rs. 9,651,312) were released in April & May- 2012 respectively.

- ****** Payments against energy bill of Feb & Mar-13 (Rs. 13,120,272 & 21,783,168) were released in April & May- 2013 respectively.

3. Preventive Maintenance

3.1 General

To minimize the plant outages and consequent avoidable generation loss of the project, periodic preventive maintenance schedules for all the equipments have been prepared & are being complied with. These periodic maintenance schedules are listed below.

- Daily maintenance schedule
- Weekly maintenance schedule
- Monthly maintenance schedule
- Quarterly maintenance schedule
- Half-Yearly maintenance schedule
- Yearly maintenance schedule

Apart from the above schedules, cleaning of both desanders at weir site & cooling water pit in power house prior to, during and after monsoons is being carried out.

3.2 Rewinding of Unit-II

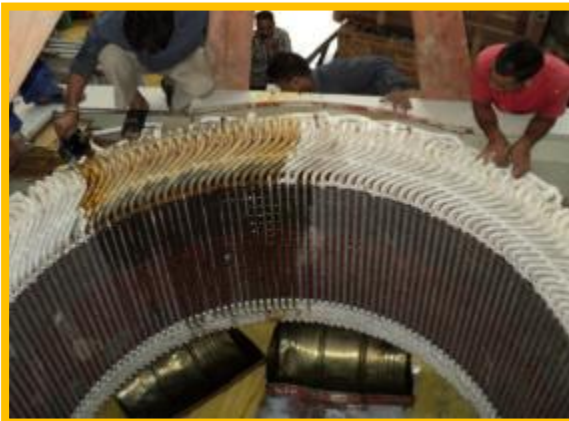
Due to pre-mature failure of stator winding of Unit-I, it was proposed to conduct the diagnostic tests viz. Partial Discharge Test & Tan Delta Test of the windings on both Generators and ELCID test on the core of Unit-2 Stator in order to determine the healthiness or otherwise of the stator windings / cores.

Work order for aforesaid diagnostic tests was earlier issued to M/s Prognosys EMS Pvt Ltd. Bangalore. These tests were conducted during October 2011. These diagnostic tests viz. Partial Discharge Tests, ELCID Tests and Tan Delta Tests established the following results.

- ✓ Tan delta and partial discharge tests conducted on the windings of both generators had established that the stator winding of Unit-II was not in healthy condition and could fail anytime in near future. Rewinding of the Stator of this Unit was thus recommended to be taken up at the earliest opportunity.
- ✓ From the detailed assessment of ELCID Test earlier conducted as a part of diagnostic test, it was established that fault current was more than the threshold value in few locations. It was recommended to attend this problem during rewinding process of Unit-II to minimize the downtime of the machine.

ELCID test was then repeated before the rewinding process of Unit-II through M/s Prognosys EMS Pvt. Ltd., Hyderabad. It established that the fault current values were less than 200 mA in all the slots. The fault current values at few locations in various slots were observed to be more than 100 mA & it was therefore suggested to monitor these points in the next ELCID test of the stator core of Unit-II.

M/s EMCO Electrodyne Pvt. Ltd. had been engaged for the manufacture, supply & rewinding of Unit-II stator at site. Some photographs of the rewinding works being carried out at site have been reproduced below.



Partial Discharge test & Tan Delta test were carried out again after the rewinding of stator coils of unit-II. From the assessment conducted, it was concluded that the stator winding test parameters are within limits for the new winding indicating that the stator winding insulation is in acceptable condition.

Unit-II was then re-commissioned on 6th of July, 2012 after completion of rewinding of stator. Since the rewinding works was carried out in the lean season as planned earlier, there was no generation loss on account of the rewinding works. Also an amount to the tune of Rs. 7,16,837 was generated by disposing off the old stator (copper) winding coils of Unit-II to M/s Ganesh Metals.

4. Annual Maintenance and Overhauling Works

Equipment wise maintenance schedules viz. Generator, Turbine & MIV, Power Transformers, Switchyard equipments, weir site structures etc. have already been issued to the Project. These

maintenance schedules are strictly adhered by the project on regular basis. Maintenance of the following equipments/structures was carried out as per the maintenance schedule.

- Generator
- Generator Transformers & other Transformers
- Turbine & MIV
- Switchyard equipments
- EOT Crane
- Weir site structures

Following major Annual Maintenance and restoration works of the Power Plant were carried out during the year:

- ✓ Repair of approach road of power house
- ✓ River widening works
- ✓ Repair of foundation of transmission poles
- ✓ Hard coating of Runner, needle tips & mouth rings of nozzle
- ✓ Cleaning of Cooling Water pit, CW filter, MIV filter, Generator cooler filter
- ✓ Cleaning of cooling water Filters of both the Units.
- ✓ Cleaning of Back Flushing Filters of both the Units.
- ✓ Repair of transmission line structure of transmission pole no 74.
- ✓ Provision for online monitoring of mandatory releases from Weir Site as per the recent guidelines of HPPCB is being incorporated in Patikari website.

5. Civil Structures – Inspections & Restoration Works

Some damages to roads & protection structures had earlier taken place to the approach roads to the Power House & Weir site respectively due to heavy rains and floods from 13th to 16th August 2011.

Repair & restoration works of the weir site were completed. Repair & restoration works on the approach roads to the Power House & Weir site had also been completed. Photographs of the repair works are shown below.



Before

After



River widening works upstream & downstream of the Power house and Packing boulders on left bank of Bhakli Khad river as earlier advised by civil design wing had been carried out.



Repair of foundation of transmission pole no 74 was also attended. The below photographs shows the completed repair works.



6. Loss of Generation - Causes and Corrective steps

6.1 Loss of Generation due to various reasons viz. plant outages, forced Grid outages & repair works during the year under report was to the tune of **1.695 MU** out of which, Generation loss of **1.108 MU** was attributable to the forced grid outages.

There are following two main factors responsible for the loss of generation from the Project in general:

- External Evacuation Constraints
- Plant Outages

6.2 External Evacuation Constraints

External constraints mainly comprise of the Grid outages in the HPSEB networks & back down instructions. Generation loss due to grid/HPSEB transmission lines tripping incidents during financial year 2012-13 was to the tune of 1.1088 MU. This is on a higher side as compared to preceding year generation loss of 0.33 MU due to grid/HPSEB transmission lines tripping incidents. This issue of grid/HPSEB transmission lines tripping incidents had been persistently followed up with the Board to eliminate such outages to the maximum extent possible and remove all evacuation constraints being faced by the project.

6.3 Plant Outages

Short and prolonged plant outages are the other major factor contributing to substantial generation loss from the project. However, by strictly implementing the preventive maintenance schedules, these outages can be reduced to a large extent thus minimizing the breakdown time of the machines. As minimization of plant outages is in our control, it was thought appropriate to glean the generation data to find out the causes for such outages and take corrective steps to avoid these failures to the maximum extent in future.

Loss of Generation due to plant outage & grid outage in the financial year under report & during preceding four years is summarized below.

Generation Loss of Patikari HEP													
	Year	FY 2007-08		FY 2008-09		FY 2009-10		FY 2010-11		FY 2011-12		FY 2012-13	
Outage/ Tripping Type	Description	Outage Duration (Min)	Energy Loss (MU)	Outage Duration (Min)	Energy Loss (MU)	Outage Duration (Min)	Energy Loss (MU)	Outage Duration (Min)	Energy Loss (MU)	Outage Duration (Min)	Energy Loss (MU)	Outage Duration (Min)	Energy Loss (MU)
Plant Outage	Malfunctoning of Vibration sensor related	184	0.01747	298	0.04361	0	0.00000	254	0.04020	0	0.00000	0	0.00000
	Trash Rack choking related	0	0.00000	4283	0.57517	0	0.00000	323	0.03722	2895	0.35767	1519	0.19648
	Cooling water filter & MIV filter related	0	0.00000	32	0.00511	101	0.00909	1976	0.27827	86	0.01331	494	0.07247
	Flange with Buckler related	0	0.00000	0	0.00000	231	0.03080	921	0.14584	0	0.00000	0	0.00000
	Transmission Line Related	0	0.00000	579	0.08252	88	0.00293	290	0.03190	14	0.00216	0	0.00000
	Governor software modification	0	0.00000	0	0.00000	0	0.00000	539	0.06030	0	0.00000	0	0.00000
	Shutdown/Trippings due to testing viz. SCADA, PD & Tan Delta etc	0	0.00000	0	0.00000	0	0.00000	0	0.00000	399	0.03453	0	0.00000
	Rewinding & Restoration Works of Unit-I	0	0.00000	0	0.00000	0	0.00000	0	0.00000	129600	10.76000	0	0.00000
	Other miscellaneous trippings	2434	0.15629	6387	0.88956	0	0.00000	820	0.11698	1625	0.23522	2838	0.31806
Grid Outage	Grid Outage (>20 min)	587	0.05260	1199	0.20433	349	0.01955	524	0.04990	345	0.05242	1950	0.24459
	Grid Outage (<20 min)	95	0.02672	946	0.44762	89	0.04021	775	0.58561	656	0.27848	1385	0.58147
	Backdown Instructions	0	0.00000	10234	0.74394	99	0.00528	2245	0.16782	0	0.00000	4619	0.28276
	Total	3300	0.25308	23958	2.99186	957	0.10786	8667	1.51404	135620	11.73379	12805	1.69581

In this context it would be appropriate to look into the break-up of generation loss due to different categories of Plant outages. As a result of proper preventive maintenance schedule, the Generation loss due to choking of trash racks was reduced to a large extent this year as compared to previous year. In fact, this year, Generation loss due to choking of trash racks is only about 55% of the preceding year. The trippings due to transmission line related faults had been reduced to zero this year by the proper preventive maintenance schedule. There were no incidents of tripping due to flange with buckler as we have procured / repaired in advance spare flange with bucklers & kept as handy in the power house. At every available opportunity, Cooling Water filters & cooling water pit and MIV filters were cleaned. In spite of this, Generation loss due to choking of Cooling Water filters & cooling water pit and MIV filters was increased to 0.0724 MU from 0.0133 MU last year.

Main factors contributing the plant outages & their mitigating measures are detailed below;

6.3.1 Trash Rack Choking related:

Trash Rack choking had been contributing to the generation loss primarily during monsoon seasons. Floating Drums arrangement for diversion of drift wood towards open Weir had earlier been provided at the intake to avoid the clogging of the trash racks to the maximum extent possible. Continuous clearing of Trash Racks manually during monsoon months had also being implemented during monsoons. However, despite of these preventive measures, trash racks are used to choke every now & then during the monsoons.

6.3.2 De-Sander Choking Related:

During past five years of operation of Patikari HEP, it has been observed that the De-silting Tanks at Weir Site get completely choked during first few rains of every monsoon season and during subsequent rains as well due to settlement of the silt and slush therein which has to be got manually removed after shutting down of the Power Station during these peak discharge months. This results not only in the avoidable loss of generation but leads to passage of high silt content to the underwater components of the Turbines as well resulting in excessive erosion damages on Runners, Nozzles, Needles etc and choking of cooling water filters and tanks in Power House. This matter was then referred to civil design wing for their suggestions on the further improvements in the existing de-silting arrangements to obviate the aforesaid problems to the maximum extent possible.

It came to notice that the holes actually provided in the De-sander plates do not conform to the construction drawings. Further the cross sectional area of the holes actually provided at the site is just 30% of the design requirement.

Civil Design wing had suggested modifying the existing holes as per design requirement for improving the efficiency of the De-silting arrangement. These modifications in the Desander plates

had been taken up now. The performance of the De-silting Tanks would be monitored in the coming monsoon months.

6.3.3 Cooling water filter related:

One (1) additional (spare) set of cooling water filters had earlier been installed to act as the standby filter thereby reducing the downtime of the plant. Earlier only one (1) set of cooling water filters was installed in the cooling water system. Cooling water filters used to get choked due to the silt coming from the river water leading to the forced shutdown of the plant and consequent loss of generation.

6.3.4 Other miscellaneous trippings:

With the modifications in the software of the Governor, the restoration time in the event of tripping was reduced considerably. This modification in the Governor software has reduced the start up duration of the machines following the grid failures, consequently minimizing the generation loss.

Inspections and preventive maintenance of Patikari to Pandoh sub-station feeders has reduced trippings on these feeders and consequent generation loss.

A comparison of Actual generation loss due to various plant outages in Million Units during financial year 2012-13 & preceding year is tabulated as under:

Type of Plant Outage	FY 2011-12	FY 2012-13
Choking of Cooling Water and MIV Filters	0.013	0.072
Choking of Trash Racks	0.358	0.197
Other miscellaneous causes	0.235	0.318

7. *Inventory Management*

Adequate optimum stocks of spares are being maintained in the Plant stores to cater for any preventive as well as other maintenance requirements of the Power Station. The consumption of Electrical, Mechanical & General store material is being regularly reported and monitored on monthly basis. Following important items of equipment and spares had been procured during the FY 2012-13.

- One (1) no. of MIV Filter Valve
- Two (2) nos. of Air Release Valve
- One (1) set of motorized valve for Brake jet valve
- Four (4) nos. of auxiliary switches for 33 kV VCBs
- Two (2) nos. of 33 kV, 400-200/1/1 Current Transformers
- Four (4) nos. of Terminal connectors for Current Transformers suitable for ACSR Dog conductor
- One (1) no. of CPU for Generator management relay (G-30)
- One (1) no. of CPU for Transformer management relay (T-60)
- Four (4) nos. of 110 V DC Contactors
- Spares for Illumination system
- One (1) no. of HP Laser Jet printer

Since the plant is in operation for more than five (5) years now, some equipment / parts viz. valves, seals etc need to be replaced in the coming lean season for the uninterrupted operation of the plant. These equipments / parts are being listed & are proposed to be procured before the lean season of the next financial year.

8. Evacuation of Power from 5 MW Swad HEP through dedicated Transmission line of Patikari HEP

16 MW Patikari Hydro Electric Project was commissioned in January, 2008 and its power is being evacuated through 33kV Patikari- Pandoh double Circuit dedicated Transmission Line. Pandoh substation is owned by Himachal Pradesh Power Transmission Corporation Ltd. (HPPTCL) which is also the STU for Himachal Pradesh.

The STU Coordination Committee of Himachal Pradesh during their meeting on 29th June, 2012 had decided that 5 MW Swad HEP of M/s Micro Hydro Electric Power Generation Pvt. Ltd. (MHEPGPL), which is situated upstream of 16 MW Patikari HEP, will evacuate its power through the above said dedicated line of PPPL. HEPGPL had agreed in the said meeting to abide by the following terms:-

- (1) To allow priority for generation from Patikari HEP and back down their generation in the event of any transmission constraints due to outages.
- (2) To strengthen the Patikari – Pandoh Transmission Line at their cost.

Further, HPPTCL had directed during said meeting that both the Parties shall enter into a Transmission Service Agreement and confirm the same to them.

PPPL also had a separate meeting with M/s MHEPGPL on 26th July, 2012 at our office in Gurgaon. M/s MHEPGPL was apprised of the Constraints related to technical & legal aspects involved in the joint power evacuation.

Various technical & legal aspects involved in this joint power evacuation which had already been discussed with M/s MHEPGPL are detailed as below.

- At present there is no Regulatory / Legal framework in force and hence no clarity on the legal, commercial and operational aspects of one generation project evacuating its power through the dedicated transmission line of another generation project. PPPL is not willing to be obligated to obtain a transmission license in case required to do so at a later stage

for its dedicated transmission line. MEPGPL would have to insulate PPPL from any obligations / loss on account of any Regulatory intervention now or later on.

- Patikari Project including its dedicated Transmission Line is registered with UNFCCC as a CDM Project and in turn has entered into Emission Reductions Purchase Agreement with EDF Trading Limited, U.K. for the sale of CERs which are worked out on the basis of energy delivered in the Grid at Pandoh Substation. PPPL had been generating revenue to the tune of Rs. 3.5 to 4.0 Cr. per annum through sale of these CERs. Proposed injection and evacuation of Swad power through Patikari – Pandoh Transmission Line and consequent additions / alterations and energy metering / apportioning / auditing arrangements would require to be got registered and approved by UNFCCC failing which registration of Patikari HEP itself may be cancelled. This process of registration of proposed changes in the Project entails costs and may take around 9 to 12 months and there is no guarantee that the same may be approved by UNFCCC. Likely expenditure to be incurred by PPPL on this registration process will have to be borne and paid in advance by MEPGPL. In case of rejection of the proposed alteration in the evacuation arrangement by UNFCCC, it would not be possible for PPPL to agree to this arrangement.

- If power from Swad Project is injected into the dedicated transmission system of Patikari HEP then the maximum power to be handled would be 28.5 MVA instead of present maximum power of 22 MVA which would result in current flow of 499 Amps per phase at normal voltages and could be even more in case low system voltage conditions. However, the current carrying capacity of existing conductor of Patikari transmission Line is 254 Amps only at 75 Deg C as guaranteed by the Supplier M/s Sterlite Industries (I) Ltd. If one circuit is under shutdown the other circuit would be overloaded requiring total backing down of generation from Swad HEP as well as Patikari HEP. Replacement of existing conductor of this transmission Line with higher current rating conductor would thus be required for the proposed joint evacuation of power from Patikari and Swad HEPs.

- The details of additions / alterations which would be required to be made in Patikari Switchyard, Pandoh Substation and strengthening of Patikari – Pandoh Transmission Line were explained by PPPL. It was reiterated by PPPL that MEPGPL will have to bear the costs of procurement and installation of such additional equipment and reconductoring and compensate the former for loss of generation during shutdowns taken while undertaking said installation and reconductoring activities. A brief note on the existing arrangements, modifications / additions required to be effected therein, preliminary drawings and Bill of Quantities have already been forwarded to M/s MEPGPL.
- It was also pointed out by PPPL that the space required for accommodating the additional equipment for MEPGPL bays is not available in and around Patikari Switchyard.
- Injection of MEPGPL's power into Patikari – Pandoh Line will lead to incremental losses on the system which will have to be borne by them.
- Patikari as well as Swad HEPs are situated on the same stream which is predominantly rain fed. Major portion of annual generation from both these Projects will thus take place during three monsoon months. Any transmission constraint during these months will as such adversely affect the generation from these Projects.
- MEPGPL were informed that 33 k V Sub Transmission System of the Board beyond Pandoh substation and up to the 132 kV Grid Station at Bijni is not very reliable and is prone to frequent avoidable trippings and consequent outages of the generating Units in our Power Stations. With the proposed injection of power from Swad Project at Patikari 33kV bus, not only the likelihood of system trippings would increase but the faults on Swad – Patikari Line would add to the outages on Patikari Generating Units leading to avoidable loss of generation.

In the meeting of the STU Coordination Committee held at Shimla on 2nd August, 2012 attended by the officials from our Group as well, it was informed that we have had a meeting with the

developers of 5 MW Swad HEP and what were the constraints and issues which need to be addressed / resolved. The Principal Secretary (Power), Govt. of Himachal Pradesh, who chaired the meeting, told that the two Parties must sort out the issues mutually and that no separate line for evacuating power of Swad HEP would be allowed.

A meeting between PPPL & MHPGPL was held on 22nd Feb, 2013 at the Gurgaon office to discuss the various techno-commercial issues involved in this context. It was agreed that MHEPGL would submit their comments on the proposed alteration /addition of proposed transmission line which would require approval of HPPTCL and HPSEB Ltd. PPPL also agreed to the suggestion of MHEPGL to engage their own consultant for obtaining UNFFCC approval to the proposed addition/alteration at their cost by obtaining Government support letters to forward the case to UNFCCC. A proposal in this context for obtaining UNFFCC approval is to be initiated by M/s MHPGPL which shall further be endorsed by M/s PPPL.

However, no further updates have been received from M/s MHEPGL in this regard.

9. Critical Issues – Resolved / Under Follow up

9.1 Permanent Residential set up for O&M Staff

Earlier O&M Staff had been accommodated in the Porta cabin installed near the power house. However, as the land on which the Porta cabin transit camp had been constructed happened to be in the state forest area, concerned HP forest division ordered vacation of the forest land. As the Porta Cabin has been dismantled as per these orders, the O&M staff residing there have been relocated and provided rented accommodation in Pandoh, wherefrom they are required to commute daily to and from Power House in three shifts.

Proper accommodation for the O&M staff near Power Station is absolutely essential for safe and smooth operation of the Plant especially during monsoon months.

The necessary construction drawings & estimates have now been issued by Civil Design wing after conducting a survey of the land adjacent to Power Plant Gate and some land behind it along the

hill slope already acquired by the Project which is not a Forest land. The total estimated cost for the Permanent Residential Accommodation including the slope protection works is expected to be the tune of INR 1.46 crore.

Construction of the field accommodation set up as per approved drawings has been put on hold due to funds constraints. Procurement of material and construction of the accommodation set up as per approved drawings shall be taken up in the financial year 2013-14 in case the required funds are available.

9.2 Opening of Letter of Credit (LC) as per PPA

It has been noticed in the recent past that there are continued delays in the release of payments by HPSEBL against our energy bills.

Hence it was intimated to HPSEBL for the immediate requirement of opening of LC in favour of PPPL for amount of Rs. 252 Lakhs & maintaining the requisite LC in accordance with the provisions of PPA between HPSEBL & PPPL. Debit notes on the delayed payments have been sent to HPSEBL from time to time. Further, in this context, number of reminders for requesting to open the LC was sent to HPSEBL. It was also submitted that in case the requested LC is not opened & operationalized, PPPL will be constrained to invoke its right under PPA to go in for appropriate legal addressal.

However no reply on this issue has been submitted by HPSEBL so far. Therefore it is proposed to file a petition with HPERC in this regard.

9.3 Signing of Supplementary PPA

As per the HPERC's Order dated 16th Jul, 2010, increase of 29 paise in the tariff under change of Law has been allowed. The increase of 29 paise in the tariff has not been implemented so far, since the Supplementary PPA has not been signed till date by the Board.

Case was being pursued regularly with the Board. However HPSEBL had now filed an appeal in HP High Court against above said HPERC Order. The court has granted the stay of said Order and as such this case is still pending decision.

9.4 *Appeal filed in APTEL*

Petition was filed with HPERC on August 22, 2008 for upward revision of the existing tariff of Rs. 2.25 for Patikari HEP. In connection with the above, HPERC's decision dated 16th Jul, 2010 had earlier been received.

Since HPERC had not agreed to our request for determination of the Tariff but have allowed a relief under change of law only, a Petition had earlier been filed with Appellate Tribunal for Electricity (APTEL) against the HPERC order dated 16th Jul, 2010 appealing for:

- Allowing increase of 29 paise in tariff from the date of commissioning instead of date of the issue of the order i.e. 16th Jul, 2010
- Redetermination of tariff based on the incurred cost and as per CERC norms.

PPPL had sought review of tariff on following two grounds:

a) Lower Return On Equity (ROE) expected under fixed tariff of Rs. 2.25/kWh; and

b) Lower water discharges in river compared to the hydrology data provided by HPSEB.

Whereas a) above has not been acceded to by APTEL, PPPL has been allowed to approach HPERC for relief on account of b) above.

The implementation of APTEL's order will be effective from and subject to the order of High Court of Himachal Pradesh on writ petition filed by HPSEBL.

Increase of 29 paise in the tariff under change of Law as per the HPERC's Order dated 16th Jul, 2010 had further been endorsed by Appellate Tribunal for Electricity (APTEL). The matter is still unresolved & under follow up.

9.5 CDM Benefit to the Project

Patikari HEP (Project) was registered with the CDM – EB, UNFCCC on 16th April 2007 as CDM Project bearing Project Number 0903. The Crediting Period under this Registration, during which Project is to be credited with CERs production, is 1st August 2007 until 31st July 2017. On recommendations of its Consultant (EIPL), Patikari Power Private Ltd (PPPL) had entered into CDM Emission Reductions Purchase Agreement (ERPA) with EDF Trading Limited (EDFT) on 16th July 2007 for sale of CERs produced from the Project till the stipulated Final Delivery Date of 1st February 2013 as per this Agreement. Mr. Samrat Sengupta, as an Independent Expert / Consultant – Climate Change & Sustainable Energy, has been coordinating with EDFT on behalf of PPPL. Further it may please be noted that the sale of CERs produced from the Project beyond February 2013 and up to 31st July 2017 is yet to be tied up.

As agreed between PPPL & EDFT through various communications on the issue regarding payments against recent delivery of CERs generated during the calendar year 2011 and issued on 22.06.2012, PPPL had raised an invoice of 14,521 CERs @ fixed price amounting to € 174,252 & other invoice of 31,744 CERs @ spot price (€ 0.287 /unit) amounting to € 9,111.

The amount of INR 1,22,29,090 against fixed price invoice & another amount of INR 6,39,117 against spot price invoice had been received by PPPL in Jun-2013.

9.6 Insurance Claims

An insurance claim on New India Insurance Company pertaining to the damages in Project area due to heavy rains & floods from 13th to 16th August, 2011 lodged earlier is still a pending settlement.

Final report of the inspections of the affected areas of the project is yet to be submitted by the surveyor to the Insurance Company.

Another claim on Insurance Company pertaining to the damages in Project area due to floods during 2nd week of August, 2007 has now been received. The estimated cost of restoration works

of the affected areas for Insurance claims was around Rs. 5.80 Crores for damages in 2007. The surveyor assessed damages at Rs. 3.66 Crores against said claim. The Insurance Co., however, had offered to pay Rs. 0.48 Crores only. Hence, the matter had earlier been referred to Arbitral Tribunal.

The Arbitral Tribunal had later awarded the surveyor's assessed amount of Rs. 3.28 Crores and interest @ 12% from the date of invocation of Arbitration Clause by Patikari Power Pvt Ltd (9th November 2009) against the insurance claim for the damages in Project area due to floods during 2nd week of August, 2007. The said amount has been received by the Company.

9.7 Payment to Penstock Land owners

Private land had been used for the construction of Penstocks of the project. However the registry of the land in favour of the company was not done at that time.

Land owners whose land was acquired for the construction of Penstocks had been identified. In this context, demarcation of land comprising Khasra No. 41 along Patikari penstock line was carried out by the concerned revenue staff in presence of the land owners. It was later established that particular khasra no. 41 was not used by PPPL & the land owners also agreed to this. Hence there was no need to take fresh approval for purchasing land. Since the earlier approval had already expired, hence the extension of the approval was needed.

In this case, as advised by Tehsildar and other revenue officials, PPPL needed to request to DC in writing for extension in approval of purchasing land U/s 118, instead of obtaining fresh approval. In view of the above, PPPL had requested for extension of time from six months from the date of the proposed revised approval U/s 118 of Himachal Pradesh Tenancy & land reforms act 1972.

The matter is under follow up.

9.8 Taking Over of Project Roads by HP PWD

Mr. Jai Ram Thakur, Cabinet Minister of HP Government and local MLA, along with the SE PWD, Mandi and XEN PWD had visited the Power House site on 23rd July 2010 to assess the possibility of routing a road on the river side upstream of the Patikari Power House.

After site inspection the SE HPPWD was of the opinion that routing of the road by extending the crates into the river and by pushing the fence inside towards the power house shall be feasible.

It was thereafter suggested that HPPWD prepare their proposal for routing the road and share it with us for review by the design wing.

Following roads have been constructed by the project during its execution

- Kuklah village to Power House (Length – 5.25 km)
- Road to Weir site (Length – 3.85 km)
- Main Road to Adit-II (Length – 3.75 km)

Our company had incurred an expenditure of Rs. 10.34 Crores on the construction of above roads and acquisition of land for the same.

As of now, there is no further progress in this case.

10. Inventory Management

Adequate optimum stocks of spares are being maintained in the Plant stores to cater for any preventive as well as other maintenance requirements of the Power Station. The consumption of Electrical, Mechanical & General store material is being regularly reported and monitored on monthly basis.

11. Safety Measures

Safety Manual had been issued to the Plant & the Safety measures as per the manual had been strictly complied. Safety charts had been displayed in the power house area. Mock drills related to

Fire Protection / Flood Protection / any other natural calamity Protection had been arranged annually in & around power house area to ensure preparedness for such exigencies.

12. Employees Welfare Measures

Various Employees Welfare measures being undertaken from time to time by the Company Management are as under:

- ✓ **Review of Annual wages** – Review of the annual wages of the O&M staff is carried out based on the performance of the employee & accordingly they are being compensated.
- ✓ Employees are also appreciated with incentives on achievement of certain target of generation.
- ✓ **Training of O&M Staff** – Various trainings related to operation & maintenance of small hydro plants & interpersonal relationships are being imparted to the employees from time to time.

The End
