



**Verified Carbon
Standard**

5 MW BRAHM GANGA HYDRO – ELECTRIC PROJECT AT KULLU DISTRICT OF HIMACHAL PRADESH, INDIA



Document Prepared by EKI Energy Services Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

5 MW Brahm Ganga Hydro – Electric Project at Kullu district of Himachal Pradesh, India, implemented by M/s. Harisons Hydel Construction Co. Private Limited (HHCCPL), is a small scale, grid connected, run-of-the-river Hydro-electric Project (HEP) and is located on the Brahm Ganga Nallah (Tributary of River Parbati) in Kullu District of Himachal Pradesh, India. The project consists of two 2.5 MW jet Pelton wheel Turbines.

The purpose of the project is to generate clean energy in a sustainable manner, utilizing hydrological resource of the Nallah. The project activity supplies electricity to the respective State Grid of India, which is highly dominated by thermal based power generating units.

In context of the ever-increasing demand of electricity, the implementation of the project contributes to help in meeting the power demand- supply gap in the Northern grid of India, which is a part of the integrated Grid system, i.e. NEWNE Grid (Now Indian Grid). Also, through utilization of the hydro potential, the project activity is displacing the same amount of electricity generated from fossil fuel based power generating units from the grid, thereby, contributing towards the reduction of Greenhouse Gas emissions (GHGs) from the atmosphere.

The project consists of two 2.5 MW jet Pelton wheel Turbines, with an expected net electricity supply of 21, 270 MWh per annum. The project commissioning date is 02-April-2008. The project is running smoothly with scheduled regular maintenance. The Major Breakdown is mentioned in section

APPENDIX 2: Major Breakdown Details.

During the current monitoring period 114,282 tCO₂e has been generated.

1.2 Sectoral Scope and Project Type

The project activity comes under the following category as per the Voluntary Carbon Standard (VCS) -2007.1¹

Sectoral scope : 01.Energy industries (renewable -/non-renewable sources)

Project Type : I. Renewable energy project

Project Category: AMS I.D, Version 15, valid from 30th October, 2009².

The project activity is not grouped or de bundled component of any other project activity.

1.3 Project Proponent

Organization name	Harisons Hydrel Construction Co. (P) Limited (HHCCPL)
Contact person	Ghanshyam Sood
Title	Director
Address	Akhara Bazar, Kullu, Himachal Pradesh, India Pin- 175101
Telephone	+91-9816024893
Email	hhccpl_kullu@yahoo.co.in

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Mr. Prakash Sahu
Title	Project Manager
Address	Office No 201, Plot No 48, Scheme 78, Vijay Nagar Part- II, Indore 452010, India
Telephone	+91-9589899649
Email	prakash@enkingint.org

¹ Voluntary Carbon Standard 2007.1; Page no. – 8; please refer to - 3 VCS Program specific issues; 3.1 Scope of the VCS Program; “project category (ies) which is part of an approved GHG Program”

²<http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9>

1.5 Project Start Date

02-April-2008 (Project Commissioning date) as per the Commissioning certificate.

1.6 Project Crediting Period

A renewable crediting period of 10 years has been chosen. The start date of the crediting period is 02-April-2008.

Start Date: 02-April-2008

End Date: 02-April-2018

1.7 Project Location

The 5 MW (2 × 2.5 MW) Hydro Electric Power Project is located near the Manikaran village on the right bank of the Brahm Ganga Nallah in District Kullu of Himachal Pradesh. The project area is approached by the motorable road of 45 km from Kullu and 70 km from the Manali town. The nearest railway station is Chandigarh, which is located about 275 km on Delhi-Kalka trunk line. The nearest airport is at Bhuntar. The project area is located between Latitude 32° 02' N and Longitude 77° 21.20' E. The physical location of the project has been shown as follows:



1.8 Title and Reference of Methodology

The methodology for the project activity is approved methodology for large-scale CDM project activities. The details of the methodology are as follows:

- Methodology: AMS I.D.
- Project Type: Type-I: Renewable Energy Projects
- Title: Grid connected renewable electricity generation
- Version No.: Version 15.0;

Reference: CDM Methodology³

The methodology refers to following CDM Tools:

- Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion version 02⁴
- Tool to calculate the emission factor for an electricity system, Version 2, 16th October, 2009⁵

1.9 Participation under other GHG Programs

The project is not rejected under any GHG program. The project proponent has declared that the project has not been rejected under any other GHG program. The copy of the declaration letter dated 21-January-2010 has been provided to the Designated Operational Entity (DOE).

1.10 Other Forms of Credit

The project activity is not availing any REC benefits and the same can be confirmed from publically available link of REC generators.

Web-link: https://www.recregistryindia.nic.in/index.php/general/publics/registered_regens PP has also submitted undertaking for not availing other forms of environmental credit for the same crediting period under consideration.

1.11 Sustainable Development

Contribution to sustainable development:

Ministry of Environment, Forests and Climate Change (MoEF&CC), has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

- **Social well-being:** The project helps in generating employment opportunities during the construction and operation phases. The project activity lead to development in infrastructure in the region like development of roads and also promotes business with improved power generation.
- **Economic well-being:** The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits. The project activity also help to reduce the demand supply gap in the state.

³ <http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9>

⁴ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-03-v2.pdf>

⁵ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.pdf>

- **Technological well-being:** The operation of project activity leads to promotion of solar power generation and encourages other entrepreneurs to participate in similar projects.
- **Environmental well-being:** Hydro being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions. The project activity generates power using zero emissions hydro energy based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the hydro plants, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

Thus there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

2.2 Local Stakeholder Consultation

As a part of continual improvement process, feedback from the associated stakeholders is vital, therefore a dedicated Visitor register cum grievance register has been placed at the project site which is accessible to stakeholders to provide their feedback on the project. It is appropriate publicly accessible location at which local stakeholders can provide their feedback on the project. This location is also conducive to continuous and regular checks for stakeholder comments. For the global stakeholders, the suggestion and the grievance can be submitted to hhccpl_kullu@yahoo.co.in

Stakeholder meetings were organized at the time of registration of project activity in order to identify the major challenges around the area, stakeholders were invited well in advance through printed invitation, calls, meeting and a notice is placed around the local common areas. Various CSR activities around site are carried out. The stakeholder are also request to share their experiences and grievances on continuous basis. Registers is used to records the grievances and feedback.

During the current monitoring period, positive feedback are received regarding site operation. No any grievances received during the current monitoring period, therefore, no any mitigation measures are required. In case of grievances, the nature of probable resolution is discussed with

the plant head office and implemented by the site incharge. The grievance copies have been submitted to DOE.

2.3 AFOLU-Specific Safeguards

Not applicable to this as this is not an AFOLU project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity comprises of two units of 2.5 MW capacity each. The construction of a simple diversion weir is carried out to divert the water which is then taken to the turbines after creating the necessary head. Electricity is generated by converting potential energy (available due to head of water) into kinetic energy (through Pelton wheel Turbines) and is then coupled with generators to further convert this kinetic energy (mechanical energy) into electrical energy. The detailed description of the project components have been described below:

Parameters	Unit	Values
1. Diversion Structure		
Type of Structure	-	Boulder Type wire
Length	m	24
Number of Gates	-	2 nos. at inlet and one nos. at bottom outlet
2. Water Conductor System		
Intake and Approach channel		
Length	m	5
Size	m	3x3.5
Desilting Tank		
Type	-	Dufour Type
Dimension	m	45x8x3.5
3. Power Tunnel		
Shape		D-shaped tunnel
Length	m	996
Dimension	m	996x2x2.4
4. Fore Bay		
Size	m	15x8
Maximum Discharge Capacity	cumecs	2.52
5. Penstock		
Number	-	01
Length	m	330
Diameter	mm	1000
6. Power House		
Type	-	Surface
Dimension	m	24.95x9.5x11.2

7. Tail Race Tunnel		
Length	m	50
Shape	-	Two rectangular RCC ducts emanating from each unit & merging together in a rectangular open channel.

The electricity is generated at 6.6 kV level and evacuated at 33 kV level. Two step up transformers, 6.6 kV/33 kV, one each for two machines is provided at switchyard near power house. The electricity at 33 kV is transmitted to the Himachal Pradesh State Electricity Board (HPSEB) sub-station.

The respective project is running smoothly, there were no any instances occurred that would alter the GHG reductions, methodology applicability and monitoring procedure. The plant went for the schedule maintenance at regular intervals. Major Breakdown register tabulated in APPENDIX 2: Major Breakdown Details.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.2.2 Project Description Deviations

Deviation 1:

Typo error related to turbine type have been revised in the current MR based upon actual site scenario. Francis turbine is mentioned instead of Pelton wheel type. The change having no impact on baseline emission calculation. The nature of change is permanent.

Deviation 2:

There is permanent change in the section 1.4 i.e. "Other Entities Involved in the Project", EKI Energy Services Limited is now included as Project Consultant.

3.3 Grouped Projects

The project is not a grouped project thus this is not applicable.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,OM,y}
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Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 5, November, 2009
Value applied	1.00493
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 05.0.0” as 3-year generation weighted average.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 5, November, 2009
Value applied	0.67518
Justification of choice of data or description of measurement methods and procedures applied	The value of BM has also been taken from “CO ₂ Baseline Database for the Indian Power Sector”, Version 5
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 5, November, 2009
Value applied	0.84006
Justification of choice of data or description of measurement methods and procedures applied	<p>The combined margin emissions factor is calculated as follows:</p> $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ <p>Where:</p> <p>EF_{grid,BM,y}= Build margin CO₂ emission factor in year y (tCO₂/MWh)</p> <p>EF_{grid,OM,y}= Operating margin CO₂ emission factor in year y (tCO₂/MWh)</p> <p>W_{OM} = Weighting of operating margin emissions factor (%) = 75%</p> <p>W_{BM}= Weighting of build margin emissions factor (%) = 25%</p>

Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	EG_y
Data unit	MWh
Description	Net electricity supplied by the project activity.
Source of data	Joint Meter Reading (JMR) at the interconnection point (sub-station)
Description of measurement methods and procedures to be applied	<p>Monthly Joint Meter Readings (JMRs) as measured from the Interconnection Point (sub-station) are taken by the designated officials of the Himachal Pradesh State Electricity Board (HPSEB) and the project proponent. There is a separate dedicated transmission line connected to Jari substation. The joint meter readings shall be recorded and signed by the authorised representative (s) of both HPSEB & the proponent. This net supply value from the JMR (covering all the values of the losses, import) would be considered for the calculation of the emission reduction out of the project activity.</p> <p>Same can also be cross checked from invoices raised to HPSEB.</p> <p>The total data would be archived on paper and would be kept at least for 2 years after the end of the last crediting period.</p>
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and at least monthly recording
Value monitored	136,044.82
Monitoring equipment	<p>Three phase Four wire Electronic Trivector Meters (digital display) are used.</p> <p>Monitoring equipment are energy meters installed at each of the project activity instance site. The accuracy class of meters, calibration frequency of meters is totally under purview of state electricity board and PP do not have any control on it. The meter details, make, calibration date, due date and respective accuracy class are mentioned in the APPENDIX 1: Calibration Records</p>
QA/QC procedures to be applied	<p>Calibration is performed once in a year.</p> <p>If the Main Meter and the Check Meter fail record or of any of the PT fuses have blown out, then the Energy would be</p>

	computed on a mutually agreeable basis between the Company and the Board for that period of defect. In case there is no mutual agreement then the matter would be referred to the Chief Electrical Inspector to the Government of Himachal Pradesh whose decision would be final and binding on both the Parties. The gross generation at project site are also recorded on hourly basis by the project proponent to crosscheck any further non- conformity.
Purpose of the data	Calculation of Baseline Emission
Calculation method	Net Energy Generation = Total energy export to the Grid – Total energy import from the grid
Comments	-

4.3 Monitoring Plan

The main purpose of monitoring is to monitor the data used to calculate the actual emission reduction from the project activity. The main parameters that are needed to be monitored are:

1. The amount of net electricity supplied to the grid EG_y in MWh.

This parameter is taken from the Joint Meter Reading (JMR) data. This net supply value from the JMR (covering all the values of the losses, import) would be considered for the calculation of the emission reduction out of the project activity.

Three phase Four wire Electronic Tri-vector Meters (digital display) are used.

Monthly Joint Meter Readings (JMRs) as measured from the Interconnection Point (sub-station) are taken by the designated officials of the Himachal Pradesh State Electricity Board (HPSEB) and the project proponent. There is a separate dedicated transmission line connected to Jari substation. The joint meter readings shall be recorded and signed by the authorised representative (s) of both HPSEB & the proponent. Same can also be cross checked from invoices raised to HPSEB.

The parameter which would be monitored as per the monitoring plan is the net electricity supplied by the project activity to the grid. A hierarchy model based on the responsibilities for executing the Monitoring plan has been shown below:

Director	Overall management and execution of monitoring plan
Plant Manager	Recording, reporting and maintaining of the Joint Meter Reading (JMR) data Quality assurance and control Periodic calibration as per monitoring plan
Shift engineer/ Support staff	Assist the Plant manager in all the above activities

The Director has the overall responsibility of the successful implementation of the monitoring plan and estimation of the emission reduction. Joint Meter Reading (JMR) data records and calibration certificates would be maintained both electronically & on paper by the Project Proponent.

All the data monitored under the monitoring plan would be kept for two years after the end of crediting period or till the last issuance of Emission Reductions (ERs) for the project activity, whichever occurs later.

Reliability:

The meters installed at the Interconnection point are jointly inspected and sealed on behalf of the Parties and shall not be interfered with either Party except in the presence of the other Party or its accredited representative(s).

If during the half yearly test checks, the Main Meter is found to be within the permissible limits of error and the corresponding Check Meter is found to be beyond the permissible limits of error, then billing would be as per the Main Meter as usual. The corresponding Check Meter shall, however, be calibrated or replaced with spare tested calibrated meter, as may be necessary.

If during the half yearly test checks, the Main Meter is found to be beyond permissible limits of error but the Check Meter is found to be within permissible limits of error, then the billing for the month and up to the date and time of the calibration/replacement of the defective Main Meter, shall be as per the Check Meter. Such meter shall be immediately calibrated or replaced with the spare tested/ calibrated meter, as may be necessary, where after billing shall be as per the Main Meter.

Frequency:

Monthly Joint Meter Readings (JMRs) as measured from the Interconnection Point are taken by the designated officials of the Himachal Pradesh State Electricity Board (HPSEB) and the project proponent. The joint meter readings shall be recorded and signed by the authorised representative (s) of both HPSEB & the proponent.

Completeness:

If the Main Meter and the Check Meter fail record or of any of the PT fuses have blown out, then the Energy would be computed on a mutually agreeable basis between the Company and the Board for that period of defect. In case there is no mutual agreement then the matter would be referred to the Chief Electrical Inspector to the Government of Himachal Pradesh whose decision would be final and binding on both the Parties. The gross generation at project site are also recorded on hourly basis by the project proponent to cross-check any further non- conformity.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The project is a run-of-the-river, small scale hydro - electric project and supplying power to the Northern grid which is part of the integrated grid system, NEWNE Grid⁶, which is dominated by fossil fuel based thermal power plants.

Hence, the applicable baseline methodology is “AMS I.D., Version 15 of Sectoral Scope 01, 30th October, 2009⁷”.

According to AMS-I. D, “the baseline emission is the product of electrical energy baseline $EG_{BL,y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor”.

$$BE_y = EG_{y,y} * EF_{CO_2}$$

Where :

BE_y Baseline emissions in year y (tCO₂e/yr)

$EG_{y,y}$ Energy Baseline in year y, kWh

EF_{CO_2} CO₂ Emission Factor in year y, tCO₂e/kWh

Therefore,

$$BE_y = 136,044.82 * 0.84006$$

$$BE_y = 114,282 \text{ tCO}_2\text{e (round down values)}$$

5.2 Project Emissions

As per AMS-I.D, Version 15, 30th October, 2009, page no. 6, point no. 14 “for most renewable energy project activities, $PE_y = 0$ ”. The project activity is a small scale, renewable energy based hydroelectric project and does not come under the projects as referred in the methodology, therefore, $PE_y = 0$.

5.3 Leakage

As per AMS -I. D. Version 15, 30th October, 2009, page no. 6, point no. 15 “If the energy generating equipment is transferred from another activity, leakage is to be considered”. Therefore, the project activity does not result in any direct or indirect emission of greenhouse gases, or any leakages. Hence, $LE_y = 0$

⁶ <http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

⁷ <http://cdm.unfccc.int/UserManagement/FileStorage/7QXAZ5036WN8BEYKUDFRPJGL21V4I9>

5.4 Net GHG Emission Reductions and Removals

The Formula used to calculate the net emission reduction for the project activity is

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission Reduction in tCO₂/year

BE_y = Baseline emission in tCO₂/year

PE_y = Project emissions in tCO₂/year

LE_y = Leakage Emissions in tCO₂/year

For the project activity during the current monitoring period, as per section 5.1

$$BE_y = 114,282 \text{ tCO}_2\text{e}$$

$$PE_y = 0 \text{ tCO}_2\text{e}$$

$$LE_y = 0 \text{ tCO}_2\text{e}$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-April-2010 to 31-December-2010	19,658	0	0	19,658
01-January-2011 to 31-December-2011	21,131	0	0	21,131
01-January-2012 to 31-December 2012	21,468	0	0	21,468
01-January-2013 to 31-December-2013	20,840	0	0	20,840
01-January-2014 to 31-December-2014	16,422	0	0	16,422
01-January-2015 to 31-December-2015	13,013	0	0	13,013
01-January-2016 to 31-March-2016	1,750	0	0	1,750
Total	114,282	0	0	114,282

The current monitoring period is from 01-April-2010 31-March-2016 and involves 2192 days. For 365 days, annual estimation of ER is 17,868 tCO₂e and for 2192 days, the same will be 107,305 tCO₂e.

The actual emission reductions are 114,282 tCO₂ which is 6.50% higher than estimated. This is due to high rainfall during current monitoring period. The rainfall is not under control of PP. As per the registered PD, sensitivity analysis page number 22, an increase in 10% in annual electricity generation result in 13.30% of project IRR. The breaching values of Project IRR is 13.61%. Therefore increase in generation doesn't impact the addionality.

APPENDIX 1: CALIBRATION RECORDS

Meter Type	Calibration Date	Sl. No.	Make	Accuracy Class	Error Factor Required
Main Meter	03-June-2010	07034165	L&T	0.2s	April 10 to June 10, Dec 11 to Feb 2012, June 2013
Main Meter	08-December-2010	07034165	L&T	0.2s	
Main Meter	28-February-2012	11068925	L&T	0.2s	
Main Meter	12-June-2012	11071309	L&T	0.2s	
Main Meter	28-June-2013	11071310	L&T	0.2s	
Main Meter	07-February-2014	07034167	L&T	0.2s	
Main Meter	11-September-2014	11071310	L&T	0.2s	
Main Meter	16-April-2015	07034167	L&T	0.2s	
Main Meter	01-February-2016	11071310	L&T	0.2s	
Main Meter	19-September-2016	15625796	L&T	0.2s	
Main Meter	05-July-2017	11071310	L&T	0.2s	
Check Meter	03-February-2010	07034167	L&T	0.2s	March 12 to June 2012, June 13, May 15 to Mar 16
Check Meter	04-September-2010	07034167	L&T	0.2s	
Check Meter	07-March-2011	07034167	L&T	0.2s	
Check Meter	12-June-2012	11071310	L&T	0.2s	
Check Meter	28-June-2013	11071309	L&T	0.2s	
Check Meter	07-February-2014	11068925	L&T	0.2s	
Check Meter	06-May-2014	11071309	L&T	0.2s	
Check Meter	19-September-2016	15625805	L&T	0.2s	
Check Meter	15-July-2017	11071309	L&T	0.2s	

Also, the calibration reports states that the errors were within permissible limit.

APPENDIX 2: MAJOR BREAKDOWN DETAILS

Sr. No.	Dated	Duration	Remarks
1	08-June-2010	11:53 hrs	33 kv line fault.
2	27-July-2010	12:50 hrs	33 kv line fault.
3	31-December-2010	16:23 hrs	33 kv line fault.
4	03-August-2011	10:17 hrs	33 kv line fault.
5	05-March-2012	11:58 hrs	33 kv line fault.
6	26-July-2012	12:55 hrs	33 kv line fault.
7	28-December-2012	12:12 hrs	33 kv line fault.
8	01-May-2013	20:53 hrs	33 kv line fault.
9	20-May-2013	10:26hrs	HPSEB Shut down
10	13-June-2013	19:07hrs	Power House shutdown (Replacement of nozzle tip & mouth piece)
11	19-November-2013	10:55hrs	HPSEB Shut down
12	30-December-2013	22:57hrs	33 kv line fault.
13	06-February-2014	68:22hrs	33 kv line fault.
14	15-February-2014	33:27hrs	33 kv line fault.
15	12-March-2014	10:25hrs	HPSEB Shut down
16	13-March-2014	10:19hrs	HPSEB Shut down
17	14-September-2014	26:30hrs	33 kv line fault.
18	10-October-2014	38:40hrs	P.T. Blast at HPSEB jari substation switch yard problem
19	28-October-2014	18:52hrs	HPSEB shutdown
20	12-November-2014	13:45hrs	33 kv line fault.
21	13-December-2014	400:52hrs	33 kv line fault.
22	02-January-2015	15:28hrs	33 kv line fault.
23	03-January-2015	38:12hrs	33 kv line fault.
24	17-April-2015	11:02hrs	33 kv line fault.
25	26-May-2015	28:25hrs	33 kv line fault.
26	18-August-2015	19:44hrs	33 kv line fault.
27	06-December-2015	10:16hrs	Power house shutdown for maintenance
31	22-September-2016	22:40hrs	33 kv line fault.
32	23-October-2016	21:47hrs	33 kv line fault.
33	07-January-2017	64:15hrs	33 kv line fault.
34	07-February-2017	10:50hrs	Power house shutdown for maintenance
35	15-February-2017	19:03hrs	Power House (Nozzle tip changed)
36	03-April-2017	20:50hrs	Maintenance Work at power house

37	06-April-2017	22:31hrs	33 kv line fault.
38	20-March-2018	22:12hrs	33 kv line fault