



**MONITORING REPORT FORM (CDM-MR) \***  
**Version 01 - in effect as of: 28/09/2010**

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\* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

**MONITORING REPORT**

Version 02, 14/12/2010

**11.3 MW Renewable Energy Project for a Grid System by K.M.Power (P) Limited**

Reference No: 0750

**5<sup>th</sup> Monitoring Report Period : 24/03/2009 to 23/03/2010 (first and last days included)****SECTION A. General description of the project activity****A.1. Brief description of the project activity: >>**

&gt;&gt;

The project activity is a bundled project comprising of three projects and generates electrical power using hydro potential available in Nippulavagu a tributary of Galeru river in Kurnool District of Andhra Pradesh state and exporting the generated electricity to the state owned power utility APTRANSCO.

The project is a run-of-the-river hydroelectric scheme that comprises a diversion structure, power canal, penstocks, powerhouse, and power evacuation system and tailrace canal. After power generation the water goes back into the river. The generated power will be exported to the grid through a 33/11 kV substations of APTRANSCO. In this process there are no greenhouse gas emissions or burning of any fossil fuels. Thus electricity is generated through sustainable means without causing any negative effect on the environment.

The details of major equipment of the project activity are furnished below:

S.No	Location of plant	Equipment details
1	Guntakandala small hydro plant	<p>2x2000 KW Vertical Kaplan Turbine, Adjustable runner &amp; indicating and recording instruments guidevanes, etc</p> <p>Synchronous generator of 3 Phase, 6.6 kV, k 15%, 50 c/s, 750 RPM, 0.8 PF and rated output 2000 KW</p> <p>Supplier: M/s Boving Fouress Ltd, Bangalore</p>
2	Velpanur small hydro plant	<p>2x1650 KW Vertical Kaplan Turbine, Adjustable runner &amp; indicating and recording instruments guidevanes, etc</p> <p>Synchronous generator of 3 Phase, 6.6 kV, k 15%, 50 c/s, 750 RPM, 0.8 PF and rated output 2000 KW</p> <p>Supplier: M/s Boving Fouress Ltd, Bangalore</p>
3	Madhavaram small hydro plant	<p>2x2000 KW Vertical Kaplan Turbine, Adjustable runner &amp; indicating and recording instruments guidevanes, etc</p> <p>Synchronous generator of 3 Phase, 6.6 kV, k 15%, 50 c/s, 750 RPM, 0.8 PF and rated output 2000 KW</p> <p>Supplier: M/s Boving Fouress Ltd, Bangalore</p>



The Guntakandala small hydro project commissioned in February 2002, Velpanuru small hydro project commissioned in November 2002 and Madhavaram small hydro project commissioned in December 2003 and units of all projects are in operation to till date.

The present monitoring report is chosen from 24 Mar 2009 to 23 Mar 2010. The net electricity exported to the State grid by the project activities is 16.6459 GWh and the net emission reductions are of 12,468 tCO<sub>2</sub>e for the present monitoring period.

## A.2. Project Participants

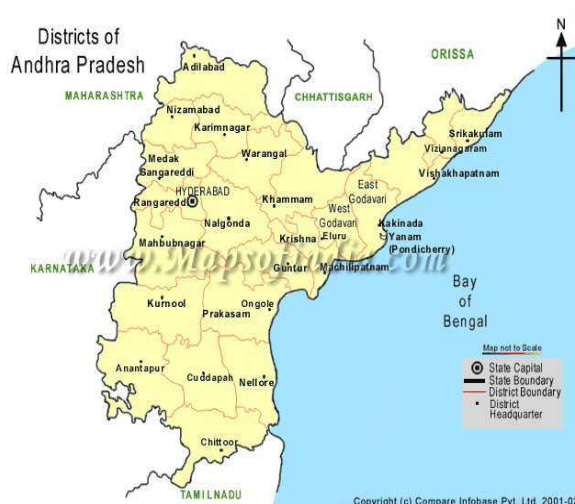
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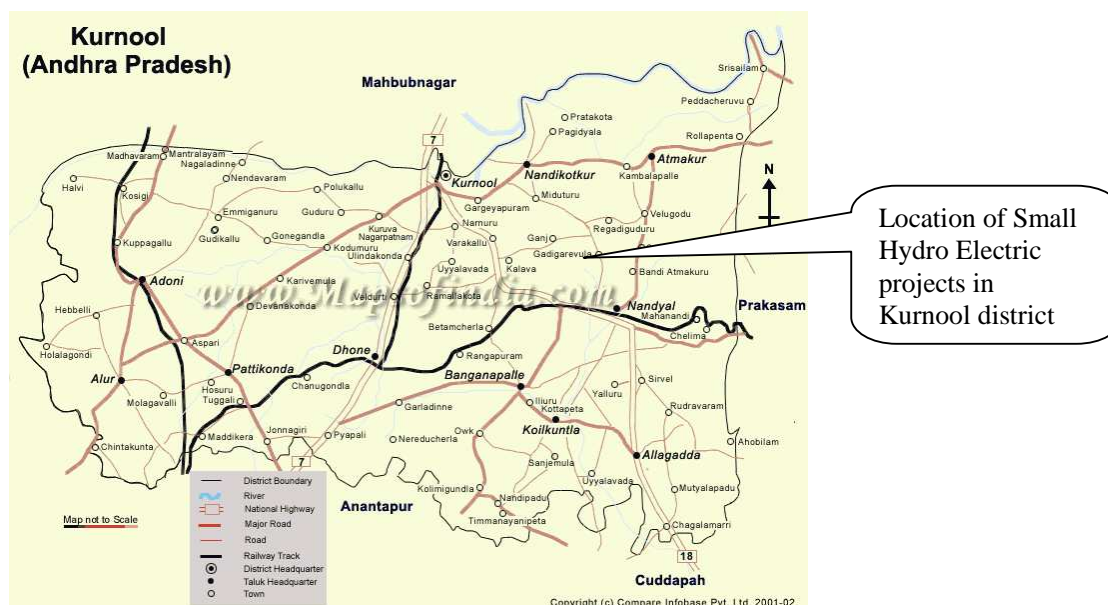
Name of the party involved(*) ((host) indicates a host party)	Private and/or public entity (ies) project participants	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (Host)	Private Entity: K.M.POWER (P) LIMITED	No.
United Kingdom (U.K)	Noble Carbon Credits Limited	No.
Japan	Mitsubishi Corporation	No.

## A.3. Location of the project activity:

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All three project activities were located at a distance of about 17 km from Velgodu which is Mandal headquarter and is about 70 km from Kurnool. Kurnool is located at a distance of 200 km from Hyderabad the state capital of Andhra Pradesh.





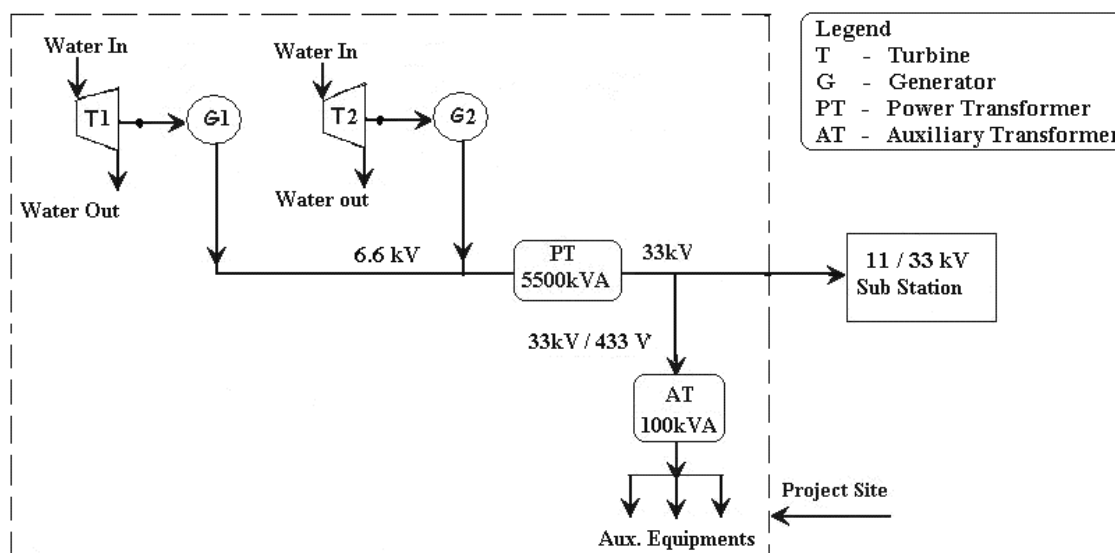
#### A.4. Technical description of the project

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The technology or power generation process using hydro resources is converting the potential energy available in the water flows into mechanical energy using hydro turbines and then to electrical energy using alternators. The generated power will be transformed to match the nearest grid sub-station for proper interconnection and smooth evacuation of power.

The generated power will be exported to the grid through a 33/11 kV substation located at Velugodu village at a distance of 5 km in respect of Guntakandala SHP and Velpanur SHP and Gadivamula village in respect of Madhavaram SHP located at a distance of 11 km from the plant location.

Detailed technical process diagram of the project activity is furnished below:



**A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:**

&gt;&gt;

Sectoral Scope : 1 : Energy industries (renewable - / non-renewable sources)

Methodology : AMS-I.D. Ver. 9 - Renewable electricity generation for a grid

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1162557680.05/view>**A.6. Registration date of the project activity:**

&gt;&gt;

14 Jan 2007

**A.7. Crediting period of the project activity and related information (start date and choice of crediting period):**

&gt;&gt;

06 Feb 2002 to 05 Feb 2012 (Fixed)

**A.8. Name of responsible person(s)/entity(ies):**

&gt;&gt;

Name/Entity	Project Participant (Yes/No)
Mr. G. Ramanarayan Reddy KM Power (P) Ltd. Telephone: +91- 40- 2341 4635 E-Mail : <a href="mailto:kmpowerltd@yahoo.co.in">kmpowerltd@yahoo.co.in</a>	Yes
Mr. B. Venu Bahadur Reddy Zenith Energy Services (P) Limited Telephone : +91- 40- 2337 6630, 2337 6631 E-Mail : <a href="mailto:venu@zenithenergy.com">venu@zenithenergy.com</a>	No

**SECTION B. Implementation of the project activity****B.1. Implementation status of the project activity**

&gt;&gt;

The project has already started commercial operations in February 2002. The project promoter has installed the monitoring equipments to monitor the parameters, which were described in the registered CDM-PDD.

The details of the project operations during this monitoring period are presented below:

		Total available hours (Hr:MM)	Running hours (Hr:MM)	Non-running hours <sup>a</sup> (Hr:MM)
Guntakandala	Unit-1	8760:00	2857:25	5902:35
	Unit-2	8760:00	2791:00	5969:00
Velpanuru	Unit-1	8760:00	1592:00	7168:00



	Unit-2	8760:00	3572:25	5187:35
Madhavaram	Unit-1	8760:00	8066:55	693:05
	Unit-2	8760:00	6036:15	2723:45

<sup>a</sup> Due to less water in the river, most of the time the project has been operated effectively by interchanging Units. For major plant outages and reasons for the reported period is furnished in Annex-4.

No significant events occurred during this monitoring period, which may impact the applicability of the methodology.

#### **B.2. Revision of the monitoring plan**

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Not applicable

#### **B.3. Request for deviation applied to this monitoring period**

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Not applicable

#### **B.4. Notification or request of approval of changes**

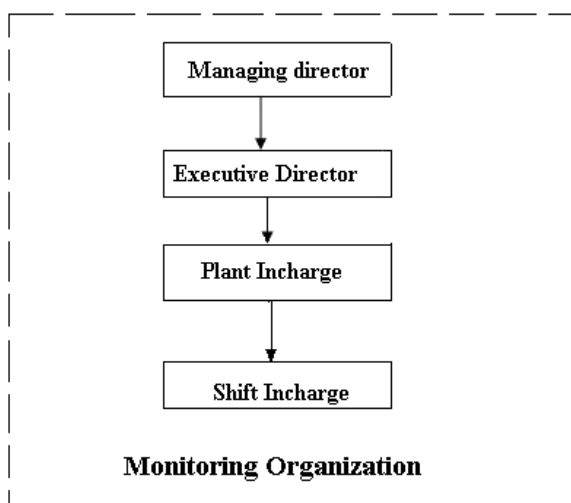
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The Project has been implemented as mentioned in the registered CDM-PDD. Hence, no notification or request of approval of changes have been made for the project.

### **SECTION C. Description of the monitoring system**

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A CDM team has been formed in KM Power (P) Limited. (KMPPL) for monitoring and verification of all the monitoring parameters as per the guidelines formulated by the management of KMPPL. Qualified and trained people monitor the parameters and emission reduction calculations. KMPPL is the sole agency responsible for implementation and monitoring of the project activity. The monitoring organisation structure is shown below:





### **Roles and Responsibilities**

#### **Managing Director**

Managing Director is responsible for the total monitoring plan. The Managing Director will examine the reports generated by the ED. He also examines the internal audit reports prepared by internal auditor and also suggest/modify the structure of report and data recording formats as and when required.

#### **Executive Director (ED)**

The Executive Director will examine the reports generated by the Plant Incharge with respect to the monthly electricity generated, exported and annual emission reduction calculations as per the monitoring plan.

#### **Plant Incharge**

The General Manager is responsible for the electricity generations at project site. He will review the monitored parameters for correctness and take corrective measures in case of minor errors in the monitored data. He also prepares a daily summary on project operation & electricity generations and report to Managing Director for any abnormality. The calibration of the meters installed will be taken care by him as per the monitoring plan.

#### **Shift Incharge**

Shift Incharge is responsible for recording the total electricity generation, auxiliary consumption, electricity export, electricity import, plant shut down times, etc. The monthly reports will be generated and submitted to the General Manager for verification and emission reduction calculations.

### **Training procedures for KM Power personnel:**

Plant Incharge will prepare Annual training program calendar in consultation with the Managing Director (MD). MD will identify the faculties & arrange for the training as per training schedule. The training details of all the employs will be maintaining in the training record registry.

### **Calibration**

Main and Check meters are being tested and certified at least once in year against an accepted laboratory standard meter in accordance with electricity standards. The calibration of the meters is carried out by APTRANSCO. The meters are deemed to be working satisfactorily if the errors are within the meter specifications of 0.2 accuracy class.

The energy meters of Gross electricity generation and Auxiliary consumption of respective power houses are being tested once in year by reputed third party agency. All the calibration test of reports of the energy meters used during the monitored period have been provided to DOE for verification.

### **Methods of data transfer and archiving policy**

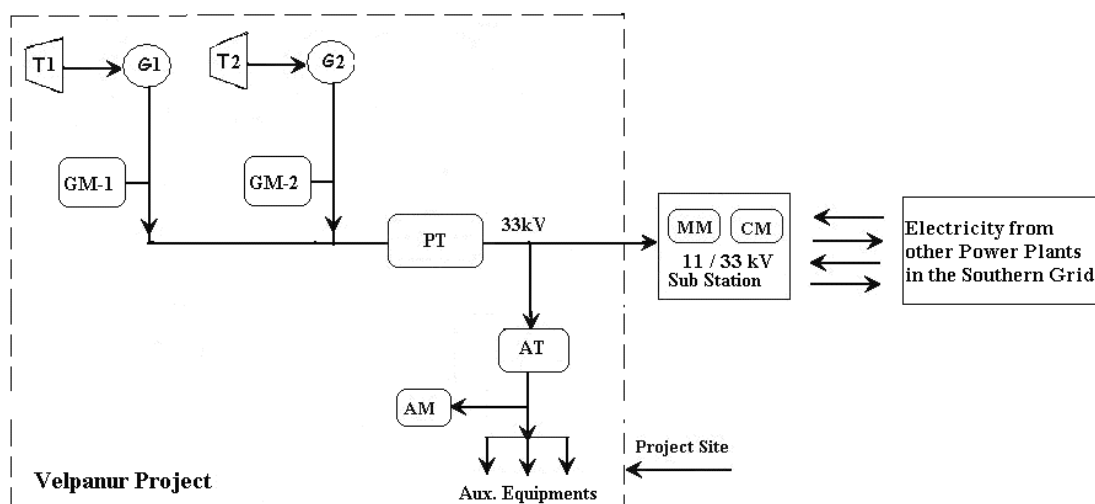
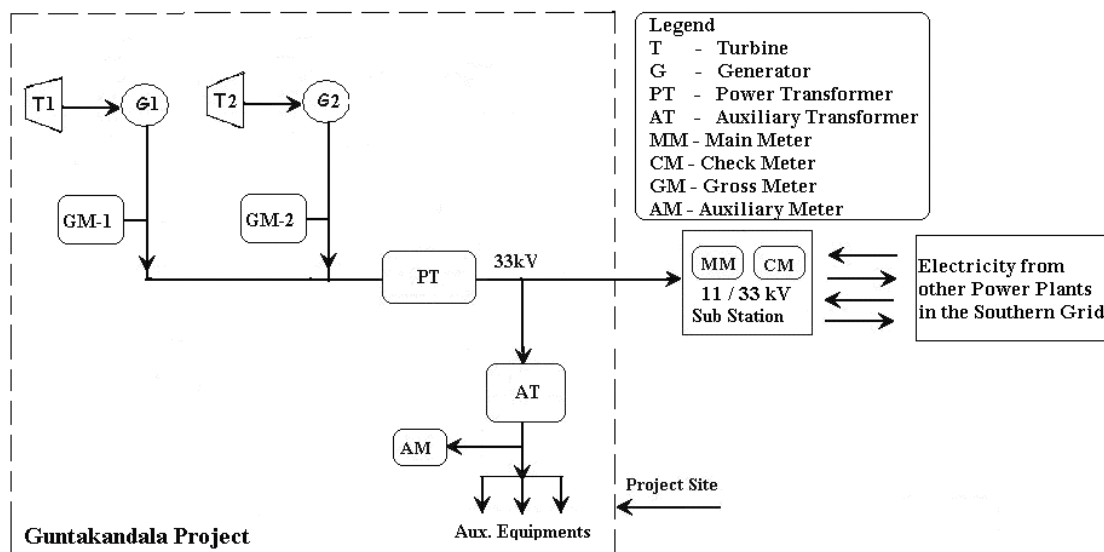
The data will be recorded both at the project site as well as at the grid substation, which is under the control of APTRANSCO. The energy will be measured using calibrated meters and recorded at the APTRANSCO sub-station. Records of measurements will be used for verification of emission reductions. Sales bills / receipts may be compared as an alternative proof of the power exported to the grid.

The responsibility of storage and archiving of information in good condition also lies with the designated person in charge. The person in charge will undertake periodic verifications and onsite

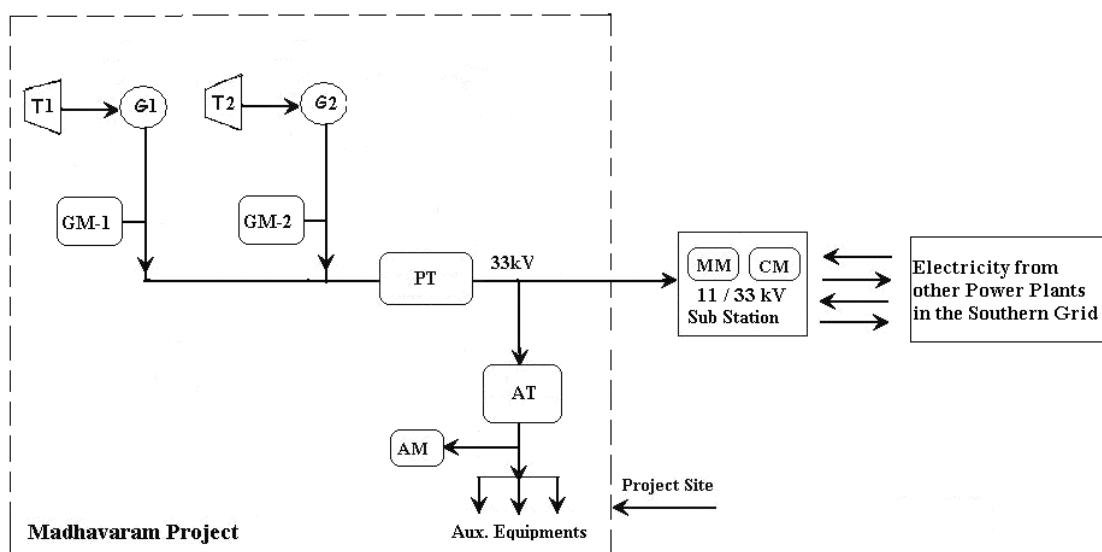
inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions.

As part of emergency preparedness, the project activities have been provided necessary provisions include standby meters, fire fighting system, etc.

The project had been provided the monitoring equipments which were described in the registered CDM-PDD and the line diagram for the monitoring parameters are furnished below:







## SECTION D. Data and parameters

### D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

N.A.

### D.2. Data and parameters monitored

Data / Parameter:	
Data unit:	kWh
Description:	Gross Generation
Measured /Calculated /Default:	On-site measurement
Source of data:	Daily generation log sheets
Value(s) of monitored parameter:	Please see Annex-2 for monthly values
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	This value is not used in the emission reduction calculation. The same is used to cross check for electricity export to grid by the project activity.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Details are furnished in Table-2
Measuring/ Reading/ Recording frequency:	Measured hourly and aggregated for daily.
Calculation method (if applicable):	-----
QA/QC procedures applied:	Meters are recalibrated periodically conform to national standard at third party reputed testing lab

### Data / Parameter:



Data unit:	kWh
Description:	Auxiliary consumption
Measured /Calculated /Default:	On-site measurement
Source of data:	Daily generation log sheets
Value(s) of monitored parameter:	Please see Annex-2 for monthly values
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	This value is not used in the emission reduction calculation. The same is used to cross check for electricity export to grid by the project activity.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Details are furnished in Table-2
Measuring/ Reading/ Recording frequency:	Measured hourly and aggregated for daily.
Calculation method (if applicable):	-----
QA/QC procedures applied:	Meters are recalibrated periodically conform to national standard at third party reputed testing lab.

<b>Data / Parameter:</b>	
Data unit:	kWh
Description:	Power Import
Measured /Calculated /Default:	On-site measurements
Source of data:	Monthly Joint Meter Readings Reports certified by APTRANSCO officials
Value(s) of monitored parameter:	Please see Annex-2 for monthly values
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Details are furnished in Table-1
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	-----
QA/QC procedures applied:	Meters are recalibrated & inspected periodically by APTRANSCO. Records of measurements are used for verification of emissions reductions. Sales bills / receipts are used for cross verification.

<b>Data / Parameter:</b>	
Data unit:	kWh
Description:	Power Export
Measured /Calculated /Default:	On-site measurements
Source of data:	Monthly Joint Meter Readings Reports certified by APTRANSCO officials
Value(s) of monitored	Please see Annex-2 for monthly values



parameter:	
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Details are furnished in Table-1
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	----
QA/QC procedures applied:	Meters are recalibrated & inspected periodically by APTRANSCO. Records of measurements are used for verification of emissions reductions. Sales bills / receipts are used for cross verification.

<b>Data / Parameter:</b>	
Data unit:	tCO <sub>2</sub> /GWh
Description:	Grid Emission Factor (EF)
Measured /Calculated /Default:	Calculated
Source of data:	Central Electricity Authority (CEA) is a government body which calculates the grid emission factors. <a href="http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm">http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm</a>
Value(s) of monitored parameter:	749.22 (Details are provided in Annex-3)  Weighted Average Emissions Rate (Excl. Imports) for the most recent year (2008-09) available for Southern Region grid. The same has been considered based on the clarification given on approved methodologies (AM_CLA_0038).
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N.A
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	N.A
QA/QC procedures applied:	This data item is required for estimating the baseline emissions and emission reductions.

Table- 1: Main Meter &amp; Check Meter Recalibration Test Details

Guntakandala Power House		
Description	Main Meter	Check Meter



Period	<b>24.03.09 to 11.11.09</b>	<b>11.11.09 to 23.03.10</b>	<b>24.03.09 to 11.11.09</b>	<b>11.11.09 to 23.03.10</b>
Serial No.	01988435	01988419	01988436	01988431
Type	Tri-vector meter	Tri-vector meter	Tri-vector meter	Tri-vector meter
Accuracy class	0.2	0.2	0.2	0.2
Calibration frequency	Annual	Annual	Annual	Annual
Date of calibration	20.10.2008	19.10.2009	20.10.2008	19.10.2009
Validity	19.10.2009	18.10.2010	19.10.200	18.10.2010
Testing Agency	Electronics Test & Development Centre (ETDC), Govt. of India			

<b>Velpanur Power House</b>				
<b>Description</b>	<b>Main Meter</b>		<b>Check Meter</b>	
Period	<b>24.03.09 to 23.12.09</b>	<b>23.12.09 to 23.03.10</b>	<b>24.03.09 to 23.12.09</b>	<b>23.12.09 to 23.03.10</b>
Serial No.	07033700	01988435	07033710	01988436
Type	Tri-vector meter	Tri-vector meter	Tri-vector meter	Tri-vector meter
Accuracy class	0.2	0.2	0.2	0.2
Calibration frequency	Annual	Annual	Annual	Annual
Date of calibration	18.11.2008	13.11.2009	18.11.2008	13.11.2009
Validity	17.11.2009	12.11.2010	17.11.2009	12.11.2010
Testing Agency	Electronics Test & Development Centre (ETDC), Govt. of India			

<b><u>Madhavaram Power House</u></b>				
<b>Description</b>	<b>Main Meter</b>		<b>Check Meter</b>	
Period	<b>24.03.09 to 24.04.09</b>	<b>24.04.09 to 23.03.10</b>	<b>24.03.09 to 24.04.09</b>	<b>24.04.09 to 23.03.10</b>
Serial No.	01988419	06607932	01988431	01988399
Type	Tri-vector meter	Tri-vector meter	Tri-vector meter	Tri-vector meter
Accuracy class	0.2	0.2	0.2	0.2
Calibration frequency	Annual	Annual	Annual	Annual
Date of calibration	15.04.2008	01.04.2009	15.04.2008	01.04.2009
Validity	14.04.2009	31.03.2010	14.04.2009	31.03.2010
Testing Agency	Electronics Test & Development Centre (ETDC), Govt. of India			

During the monitored period, the energy meters (both Main meter & Check meter) were removed and installed other calibrated meters for periodic recalibration test for reliability & improve accuracy of the electricity metering. The meters are being tested by Electronics Test & Development Centre (ETDC),



Govt. of India under the supervision of state utility testing agency. Copies of calibration test reports are being provided to DOE for verification.

During the monitored period, some of the energy meters were positioned beyond calibration due date (one year from the date of calibration test). The emissions due to delayed calibration period are estimated as per guideline i.e. Annex 60 of EB 52 and the details are furnished below:

Guntakandala Power House		
Period ---->	24/03/09 to 11/11/09	
	Main meter	Check meter
Installed meter S.Nos. during this period	1988435	1988436
Date of Calibration test	20/10/08	
Validity	19/10/09	
Delayed calibration period	20/10/09 to 11/11/09	
Emissions due to delayed calibration period	0 [See Note -1]	
<b>Note -1:</b> The plant operations have been stopped on 02 Oct 2009 due to heavy floods in the region and drowned the plant equipments in the flood water. Subsequently the equipments overhauling were carried out and restarted plant operations on 9 Dec 2009. Further there was no import from 02 Oct to 23 Nov 2009 due to damage of transmission line.		

Velpanur Power House			
Period ---->		24/03/09 to 23/12/09	
		Main meter	Check meter
Installed meter S.Nos. during the period		7033700	7033710
Date of Calibration test		18/11/08	
Validity		17/11/09	
% of error indicated in the test report		-0.01% #	0.065% #
Max. permissible error of the energy meter		0.2%	0.2%
Delayed calibration period		18/11/09 to 23/12/09	
Adjusted the Monthly Joint Energy Meter Readings for the period [Electricity adjusted due to delayed calibration test]		22/10/09 to 23/12/09	
		Export	Import
Electricity Measured	kWh	700	900
Adjusted on account of delayed calibration	kWh	699	902
Net electricity displaced Measured	kWh	-200	



Net electricity displaced <sup>Adjusted</sup>	kWh	-203
Difference in Net electricity displaced	kWh	3
Baseline emission factor	tCO <sub>2</sub> /GWh	749.22
Emissions - Calculated	tCO <sub>2</sub> e	0.0024
Considered	tCO <sub>2</sub> e	1.0

<sup>#</sup> Meters removed on 23/12/09 and carried out calibration test on 07/04/10

Madhavaram Power House		
Period ---->	24/03/09 to 24/04/09	
	Main meter	Check meter
Installed meter S.Nos. during this period	1988419	1988431
Date of Calibration test	15/04/08	
Validity	14/04/09	
% of error indicated in the test report	-0.101% <sup>##</sup>	
Max. permissible error of the energy meter	0.2%	
Delayed calibration period	15/04/09 to 24/04/09	
Adjusted the Monthly Joint Energy Meter Readings for the period [Electricity adjusted due to delayed calibration test]	24/03/09 to 24/04/09	
	Import [See Note -2]	
Electricity <sup>Measured</sup>	kWh	1,300
Adjusted on account of delayed calibration	kWh	1,303
Difference	kWh	3
Baseline emission factor	tCO <sub>2</sub> /GWh	749.22
Emissions - Calculated	tCO <sub>2</sub> e	0.0019
Considered	tCO <sub>2</sub> e	1.0
<p><b>Note -2:</b>  The plant operations have been stopped on 09 April 2009 due to non availability of water on account off-season till 28 July 2009. Hence export is zero.</p> <p>However, the import readings have been adjusted for the delayed calibration period in the estimation of emissions due to delayed calibration period.</p> <p><sup>##</sup> Meters removed on 24/04/09 and carried out calibration test on 19/10/09.</p>		

**Table- 2: Gross Energy Generation Meter & Auxiliary Power Consumption Meter  
Recalibration Test Details**



Guntakandala Power House			
Description	Gross Energy Meter		Aux. Power
	Unit -1	Unit -2	
Serial No.	A3211033	<u>A3211032</u>	<u>F40/853-502</u>
Period	24.03.09 to 23.03.10		24.03.09 to 23.03.10
Date of calibration	05.01.09 & 15.07.09		05.01.09 & 15.07.09
Type	Energy meter		Energy meter
Accuracy class	0.2		0.2
Calibration frequency	Annual		Annual
Testing Agency	Sri Sairam Engg. Works, Kurnool		Sri Sairam Engg. Works, Kurnool

Velpanur Power House			
Description	Gross Energy Meter		Aux. Power
	Unit -1	Unit -2	
Serial No.	A3220424	<u>A3220426</u>	<u>F40/853-502</u>
Period	24.03.09 to 23.03.10		24.03.09 to 23.03.10
Date of calibration	05.01.09 & 16.07.09		05.01.09 & 16.07.09
Type	Energy meter		Energy meter
Accuracy class	0.2		0.2
Calibration frequency	Annual		Annual
Testing Agency	Sri Sairam Engg. Works, Kurnool		Sri Sairam Engg. Works, Kurnool

Madhavaram Power House						
Description	Gross Energy Meter				Aux. Power	
	Unit -1		Unit -2			
Period	24.03.09 to 03.03.10	03.03.10 to 23.03.10	24.03.09 to 09.02.10	09.02.10 to 23.03.10	24.03.09 to 09.02.10	09.02.10 to 23.03.10
Serial No.	A32300614	B3281357	A32300613	B3281359	F40/1536-603	191747/104806-4909
Date of calibration	05.01.09 & 17.07.09	07.02.10	05.01.09 & 17.07.09	07.02.10	05.01.09 & 17.07.09	07.02.10
Type	Energy meter		Energy meter		Energy meter	Energy meter
Accuracy class	0.2		0.2		0.2	0.2
Calibration frequency	Annual		Annual		Annual	Annual
Testing Agency	Sri Sairam Engg. Works, Kurnool		Sri Sairam Engg. Works, Kurnool		Sri Sairam Engg. Works, Kurnool	Sri Sairam Engg. Works, Kurnool

During the monitored period, the energy meters Gross generation and Auxiliary consumption were removed and installed other calibrated meters for periodic recalibration test for reliability & improve accuracy of the electricity metering.

#### SECTION E. Emission reductions calculation

**E.1. Baseline emissions calculation**

&gt;&gt;

The baseline emissions are calculated as follows:

$$BE_y = EG_y \cdot EF_y$$

Where  $EG_y$  is the net electricity export to grid in a given year (GWh)

$EF_y$  is the emission factor for a given year (tCO<sub>2</sub>/GWh)

**E.2. Project emissions calculation**

&gt;&gt;

The project emissions from the project activity are considered as zero.

**E.3. Leakage calculation**

&gt;&gt;

Leakage is not considered from the project activity.

**E.4. Emission reductions calculation / table**

&gt;&gt;

**A. Emissions reductions for the monitored period**

The following formula is adopted for calculating emission reductions generated by the project activity:

$$ER_y = BE_y - PE_y - L_y$$

Where  $ER_y$  is emission reductions in a given year

$BE_y$  is baseline emissions in a given year

$PE_y$  is project emissions in a given year

$L_y$  is leakage in a given year

Parameter	Unit	Guntakandala	Velpanuru	Madhavaram	Total
Electricity Exported to Grid	kWh	7,311,400	5,349,400	4,005,300	16,666,100
Electricity Imported from Grid	kWh	4,100	7,200	8,900	20,200
Net Electricity Exported to Grid	kWh	7,307,300	5,342,200	3,996,400	16,645,900
	GWh	7.307	5.342	3.996	16.646
Emission Factor	t CO <sub>2</sub> /GWh	749.22	749.22	749.22	
Baseline Emissions	t CO <sub>2</sub> e	5,474	4,002	2,994	12,470
Project Emissions	t CO <sub>2</sub> e	0	0	0	0
Leakages	t CO <sub>2</sub> e	0	0	0	0
Emission Reductions	t CO <sub>2</sub> e	<b>5,474</b>	<b>4,002</b>	<b>2,994</b>	<b>12,470</b>

**B. Emissions due to delayed calibration period**



As the units of project activity were not operated during the delayed calibration period, the PP has considered zero emissions on account of delayed calibration period and the reasons are already furnished under Table -1 of Sec D.2.

### C. Net Emission Reductions for the reported period

Emission reductions based on Recorded Monthly Export & Import readings	tCO <sub>2</sub> e	12,470
Emissions due to Electricity adjusted for the Delayed Calibration Period	tCO <sub>2</sub> e	2
Net emission reductions for the reported period	tCO <sub>2</sub> e	12,468

*The detailed calculation of emission reductions are presented in excel spread sheet.*

### E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

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Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO <sub>2</sub> e)	25,511	12,468

### E.6. Remarks on difference from estimated value in the PDD

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The project activity had been envisaged for usage of water flows of Nippulavagu which is a tributary to Galeru river flowing in the same district (Kurnool). The net emission reductions are 51.1% lower than estimated in the registered CDM-PDD. During the reported period, the units of all three project activities were badly affected by heavy floods<sup>1</sup> due to which the units stopped generations for more than 2 months for equipment cleaning & overhauling.

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<sup>1</sup> <http://www.eha-health.org/emergencies/eharesponse/2009andhrafflood>



**Annex -1**

**Additional Monitoring Information**

- A. The following document is made available to this report
  - /1/ Spread sheet for Emission Reduction calculations
  
- B. Copies of the following documents are provided to DOE for verification
  - /1/ Monthly Joint Meter Readings certified by APTRANSCO
  - /2/ Calibration reports for the reported period

**Annex -2****Consolidated Report for Monitored Parameters During the Monitored Period**

Monitored Period	Gross Electricity Generated, kWh			Aux. Power Consumption, kWh		Electricity Exported to Grid	Electricity Imported from Grid	Net Electricity Exported to Grid
	UNIT-1	UNIT-2	TOTAL	Measured at Project site (See Note-1)	Calculated (See Note-2)	kWh	kWh	kWh
<b>GUNTAKANDALA POWER HOUSE</b>								
24.03.09 to 24.04.09	287,060	0	287,060	2,981	7,860	279,400	200	279,200
24.04.09 to 23.05.09	0	0	0	56	100	0	100	-100
23.05.09 to 23.06.09	0	0	0	45	100	0	100	-100
23.06.09 to 23.07.09	0	0	0	129	200	0	200	-200
23.07.09 to 24.08.09	690	543,170	543,860	4,857	14,660	529,600	400	529,200
24.08.09 to 23.09.09	1032,130	523,720	1,555,850	7,246	34,150	1,522,400	700	1,521,700
23.09.09 to 22.10.09	452,190	0	452,190	1,586	9,690	442,600	100	442,500
22.10.09 to 23.11.09	0	0	0	0	0	0	0	0
23.11.09 to 23.12.09	327,780	56,360	384,140	3,256	8,840	376,800	1,500	375,300
23.12.09 to 23.01.10	613,570	778,800	1,392,370	6,328	30,670	1,362,200	500	1,361,700
23.01.10 to 22.02.10	528,580	1,153,040	1,681,620	7,262	28,920	1,652,700	0	1,652,700
22.02.10 to 23.03.10	349,840	821,780	1,171,620	6,802	27,220	1,145,700	300	1,145,400
<b>Sub-Total</b>	<b>3,591,840</b>	<b>3,876,870</b>	<b>7,468,710</b>	<b>40,548</b>	<b>161,410</b>	<b>7,311,400</b>	<b>4,100</b>	<b>7,307,300</b>
<b>VELPANUR POWER HOUSE</b>								
24.03.09 to 24.04.09	0	290,330	290,330	3,369	7,830	283,300	800	282,500
24.04.09 to 23.05.09	0	0	0	1,117	1,200	0	1,200	-1,200
23.05.09 to 23.06.09	0	0	0	934	1,200	0	1,200	-1,200
23.06.09 to 23.07.09	0	0	0	792	1,000	0	1,000	-1,000
23.07.09 to	460	475,450	475,910	4,565	11,910	464,500	500	464,000



24.08.09								
24.08.09 to 23.09.09	546,550	880,860	1,427,410	6,633	28,510	1,399,500	600	1,398,900
23.09.09 to 22.10.09	267,600	299,470	567,070	2,510	10,270	556,900	100	556,800
22.10.09 to 23.11.09	0	0	0	0	0	0	0	0
23.11.09 to 23.12.09	0	1,260	1,260	509	1,460	700	900	-200
23.12.09 to 23.01.10	141,000	536,360	677,360	3,862	12,060	665,900	600	665,300
23.01.10 to 22.02.10	380,070	818,490	1,198,560	6,505	19,360	1,179,300	100	1,179,200
22.02.10 to 23.03.10	205,400	610,440	815,840	6,731	16,740	799,300	200	799,100
<b>Sub-Total</b>	<b>1,541,080</b>	<b>3,912,660</b>	<b>5,453,740</b>	<b>37,527</b>	<b>111,540</b>	<b>5,349,400</b>	<b>7,200</b>	<b>5,342,200</b>
<b>MADHAVARAM POWER HOUSE</b>								
24.03.09 to 24.04.09	0	308,510	308,510	2,156	8,610	301,200	1,300	299,900
24.04.09 to 23.05.09	0	0	0	1,360	1,600	0	1,600	-1,600
23.05.09 to 23.06.09	0	0	0	800	1,100	0	1,100	-1,100
23.06.09 to 23.07.09	0	0	0	965	1,300	0	1,300	-1,300
23.07.09 to 24.08.09	0	479,710	479,710	4,110	11,810	468,500	600	467,900
24.08.09 to 23.09.09	441,295	1,104,760	1,546,055	6,032	16,755	1,529,600	300	1,529,300
23.09.09 to 22.10.09	233,845	378,120	611,965	2,300	5,565	606,400	0	606,400
22.10.09 to 23.11.09	0	0	0	0	-100	200	100	100
23.11.09 to 23.12.09	0	0	0	0	700	0	700	-700
23.12.09 to 23.01.10	0	0	0	0	800	0	800	-800
23.01.10 to 22.02.10	0	319,650	319,650	1,018	5,050	315,400	800	314,600
22.02.10 to 23.03.10	93,470	701,760	795,230	5,011	11,530	784,000	300	783,700
<b>Sub-Total</b>	<b>768,610</b>	<b>3,292,510</b>	<b>4,061,120</b>	<b>23,752</b>	<b>64,720</b>	<b>4,005,300</b>	<b>8,900</b>	<b>3,996,400</b>
<b>Grand Total</b>			<b>16,983,570</b>	<b>101,827</b>	<b>337,670</b>	<b>16,666,100</b>	<b>20,200</b>	<b>16,645,900</b>

**Note-1:** Measured aux. consumption includes part of electricity generated by the project activity and electricity imported from grid taken through energy meter located on LT panel at project site. The losses on account of power transformer & transmission



**Note-2:** Computed based on the gross electricity generation recorded in the plant and electricity exported to the grid & electricity imported from grid readings certified by APTRANSCO & Plant personnel.

## Annex -3

### Baseline Information

From Carbon Dioxide Baseline Data base, Version 5, November 2009 published by Government of India, Ministry of Power Central Electricity Authority, Government of India.

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

### **Appendix B Grid Emission Factors**

*Table A: Values for all regional grids for FY 2005-06 until FY 2008-09, Excluding inter regional and cross-border electricity transfers. Note: values are rounded off to two decimals see the web link given above for additional decimals places (Database – Excel worksheet)*

#### **Weighted Average Emission Rate (tCO<sub>2</sub>/MWh) (excl. Imports)**

	2005-06	2006-07	2007-08	2008-09
NEWNE	0.84	0.83	0.82	0.844339
South	0.73	0.72	0.72	0.749227
India	0.82	0.80	0.80	0.82

#### **Simple Operating Margin (tCO<sub>2</sub>/MWh) (excl. Imports) (1)**

	2005-06	2006-07	2007-08	2008-09
NEWNE	1.02	1.02	1.01	1.02
South	1.01	1.00	0.99	0.97
India	1.02	1.01	1.01	1.01

#### **Build Margin (tCO<sub>2</sub>/MWh) (excl. Imports)**

	2005-06	2006-07	2007-08	2008-09
NEWNE	0.67	0.63	0.60	0.68
South	0.71	0.70	0.71	0.82
India	0.68	0.65	0.63	0.71

#### **Combined Margin (tCO<sub>2</sub>/MWh) (excl. Imports) (1)**

	2005-06	2006-07	2007-08	2008-09
NEWNE	0.85	0.82	0.81	0.85
South	0.86	0.85	0.85	0.89
India	0.85	0.83	0.82	0.86

**Annex -4****Details of major shut downs and reasons for the monitored period****Guntakandala Power House- Unit I:**

Period	Type of Shut down (Hr:Mn)			Reason
	Others	Planned	Forced	
27.03.09 to 28.03.09			36:00	Low discharge of water
07.04.09 to 08.04.09			18:00	
09.04.09 to 28.07.09	2424:00			Off-season
29.07.09 to 27.08.09			712:45	Low discharge of water
03.09.09 to 04.09.09			26:40	
02.10.09			7:40	
03.10.09 to 09.12.09			1623:30	Equipment overhauling due to Heavy floods
12.12.09 to 13.12.09			22:00	Low discharge of water
25.12.09 to 30.12.09			72:40	
04.01.10 to 08.01.10			120:00	
24.01.10 to 30.01.10			146:15	
02.02.10			12:00	
96.03.10 to 23.03.10			374:20	
* short interruption			306:45	
<b>Total</b>	<b>2424:00</b>	<b>0:00:00</b>	<b>3478:35</b>	

\* Short interruption includes the both grid failures and transmission line problems

**Guntakandala Power House- Unit II :**

Period	Type of Shut down (Hr:Mn)			Reason
	Others	Planned	Forced	
24.03.09 to 08.04.09			384:00	Low discharge of water
09.04.09 to 28.07.09	2424:00			Off-season
29.07.09 to 31.07.09			47:00	Low discharge of water
25.08.09			9:35	Grid failure
27.08.09 to 31.08.09			108:30	Low discharge of water
02.09.09 to 08.09.09			131:35	



16.09.09 to 18.09.09			50:15	
19.09.09 to 02.10.09			336:00	
03.10.09 to 18.12.09			1842:00	Equipment overhauling due to Heavy floods
20.12.09 to 03.01.10			325:05	Low discharge of water
16.03.10 to 17.03.10			15:55	
*short interruption			295:05	
<b>Total</b>	<b>2424:00</b>	<b>00:00</b>	<b>3545:00</b>	

## Velpanur Power House- Unit I :

Period	Type of Shut down (Hr:Mn)			Reason
	Others	Planned	Forced	
24.03.09 to 08.04.09			384:00	Low discharge of water
09.04.09 to 28.07.09	2424:00			Off-season
29.07.09 to 30.08.09			792:00	Low discharge of water
31.08.09 to 02.09.09			53:15	Trash Cleaning & Low discharge of water level
93.09.09 to 08.09.09			107:25	Low discharge of water
30.09.09 to 02.10.09			30:30	Supply Failed, Trash Cleaning & Low discharge of water level
03.10.09 to 11.01.10			2417:45	Equipment overhauling due to Heavy floods
13.01.10 to 18.01.10			123:25	Bearings Problem
25.01.10 to 30.01.10			134:00	Low discharge of water
02.02.10			13:10	
06.03.10 to 23.03.10			391:400	
*short interruptions			297:30	
<b>Total</b>	<b>2424:00</b>	<b>0:00</b>	<b>4744:00</b>	

## Velpanur Power House- Unit II :

Period	Type of Shut down (Hr:Mn)			Reason
	Others	Planned	Forced	
24.03.09 to 08.04.09			35:45	Low discharge of water
09.04.09 to 28.07.09	2424:00			Off-season
29.07.09 to 31.07.09			44:05	Low discharge of water





02.09.09 to 04.09.10			33:20	Trash Cleaning & Low discharge of water level
13.09.10			8:35	PT, Resistor and cooling motor problem
02.10.09			9:30	Supply Failed, Trash Cleaning & Low discharge of water level
03.10.09 to 04.01.10			2245:45	Equipment overhauling due to Heavy floods
24.01.10 to 25.01.10			16:20	Low discharge of water
14.03.10 to 17.03.10			37:10	
*short interruptions			333:05	
<b>Total</b>	<b>2424:00</b>	<b>0:00</b>	<b>2763:35</b>	

**Madhavaram Power House- Unit I :**

Period	Type of Shut down (Hr:Mn)			Reason
	Others	Planned	Forced	
24.03.09 to 06.04.09			336:00	Low discharge of water
09.04.09 to 28.07.09	2424:00			Off-season
29.07.09 to 06.09.09			960:00	Low discharge of water
01.10.09 to 02.10.09			31:00	
03.10.09 to 04.03.10			3664:15	Equipment overhauling due to Heavy floods
09.03.10			15:35	Generator gear box problem
10.03.10 to 23.03.10			336:00	Low discharge of water
*Short Interruption			300:05	
<b>Total</b>	<b>2424:00</b>	<b>0:00</b>	<b>5642:55</b>	

**Madhavaram Power House- Unit II :**

Period	Type of Shut down (Hr:Mn)			Reason
	Others	Planned	Forced	
27.03.09			9:20	Line break down due to failure of pin insulator at NDL s.s
03.04.09 to 08.04.09			65:00	Low discharge of water
09.04.09 to 28.07.09	2424:00			Off-season
29.07.09 to 30.07.09			33:00	Low discharge of water
02.10.09			12:30	208 DP all disc insulators burned & high capacity of flood water plant



				was damage
03.10.09 to 10.02.10			3140:35	Equipment overhauling due to Heavy floods
17.02.10			9:20	Transmission line problem
20.02.10			4:25	Supply failed at NDL S.S due to L.C maintenence purpose
09.03.10			5:30	Supply Failed at NDL S.S declared L.C due to somayajula palli breaker failure
15.03.10 to 17.03.10			27:15	Low discharge of water
20.03.10			7:00	
*Short Interruption			298:20	
<b>Total</b>	<b>2424:00</b>	<b>0:00</b>	<b>3612:15</b>	

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## History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
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