Bugoye 13.0 MW Run-of-River Hydropower Project

Document Prepared by: Carbon Limits AS

Contact Information: Mark Davis, Norfund, mark.davis@norfund.no

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Prepared By	François Sammut, Carbon Limits AS
Contact	Øvre Vollgate 6, 0158 Oslo, Norway fsa@carbonlimits.no Phone: +47 48260402

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1 PROJECT DETAILS

1.1 Summary Description of Project

TronderPower Ltd has implemented the Bugoye hydropower project, a run-of-river plant. The project is located at the foot of the Rwenzori Mountains in the Kasese District, Western Uganda. The project diverts water from the river Isya and runs via a five kilometer-long canal into a 950 meter-long penstock with a head of 160 meters. After passing through two turbines, the water is discharged to the Mubuku River. The project uses the remaining head between two existing hydropower plants; Mubuku 1, upstream of the project site, and Mubuku 3, downstream of the project site. The hydro power plant is connected to the national grid via a 6 km long transmission line routed to the Nkenda substation. The primary purpose of the project is to supply affordable renewable energy to the population of Uganda.

Implementation of the project consists of construction of the following main items:

- A main intake and sedimentation basin where water from the river Mubuku is diverted through a 1,0 km canal to the river Isya;
- A second intake and sedimentation basin at the river Isya, where tailrace water from the Mubuku 1 power station is added to the system;
- An open concrete headrace canal with total length of 4.0 km;
- A spillway of approximately 1 km, a forebay and 950 m penstock;
- Power house with two horizontal 7.228 MW Francis turbines (manufactured by Mavel) and two 7.140 MW generators (manufactured by manufactured by ELPROM ZEM);
- Tailrace canal back to the Mubuku river;
- Switch station and a 33 kV transmission line of 6.5 km;
- An emergency diesel generator.

Total electricity production for year 2009 after official commissioning is based on 1,620.7 operating hours[1] for unit 1 and 1,880.2 operating hours for unit 2, and estimated to be 15,805 MWh[2], which is sold to the Uganda Electricity Transmission Company Limited (UETCL).

Annual electricity generation for year 2010 is based on 6,682.1 operating hours for unit 1 and 4,694.4 operating hours for unit 2; The generated 66,359 MWh is sold to the Uganda Electricity Transmission Company Limited (UETCL) as per the power purchase agreement dated 28th February 2008.[3]

Below is a summary of key events related to the project activity and related infrastructure:

[1] The number of operating hours for year 2009 is calculated by subtracting the number of down-time hours from 2064 (i.e. total number of hours from the commissioning till end of the year) for each unit.

[2] The total annual generation is calculated by summing up the monthly generation reports which are confirmed by UETCL and serve as reference to the invoices sent to the purchaser.

[3] The number of operating hours for year 2010 is calculated by subtracting the number of down-time hours from 8760 (i.e. total number of hours from of the year) for each unit.

Date(s):	Description of event:
January 2008	Start of construction of the Bugoye 13.0 MW Run-of-River Hydropower plant
7 October 2009	Commissioning of the Bugoye 13.0 MW Run-of-River Hydropower plant
1 January 2011	Registration date for the "Bugoye 13.0 MW Run-of-River Hydropower Project" CDM project activity
1 January 2011	Start of CDM monitoring period

During Monitoring Period No. 00 (from 07/10/2009 to 31/12/2010), the net emission reductions achieved is calculated to be **51,177 tCO_2e** in accordance with the formulae presented in Section B.6.3 of the registered PDD (see Section E below for detailed calculations).

1.2 Sectoral Scope and Project Type

1. Energy (renewable/non-renewable)

1.3 Project Proponent

Tronder Power Ltd.
PO Box 11103, Crusader House, 3 Portal Avenue, Kampala, Uganda
Tel: +256 (41) 4340243 - Fax: +256 (41) 4257861
Email: post@tronderpower.com

Contact names: Annicent Busingye (General Manager), Losio Lemuresuk Chaplin (Operational Manager)

1.4 Other Entities Involved in the Project

Not Applicable

1.5 Project Start Date

7 October 2009

1.6 Project Crediting Period

7 October 2009 to 31 December 2010. Total number of years: 1 year, 2 months, 25 days

1.7 Project Location

The project is located in the Bugoye Sub County which is situated around 15 km north of Kasese town, in Kasese District in the Western region of Uganda, 400 km drive from Kampala, in the Republic of Uganda.

Coordinates for the main project infrastructure are given below:

Project coordinates		
Diversion intake:	0 20’02.30’’N	30 04’27.76’’E
Intake:	0 19’46.58’’N	30 04’16.27’’E
Forebay:	0 18’51.93’’N	30 05’43.25’’E
Power station:	0 18’25.80’’N	30 05’57.57’’E
Tailrace outlet:	0 18’27.94’’N	30 06’07.20’’E

1.8 Title and Reference of Methodology

The project comes under AMS Type I – Renewable Energy Project and Category I.D.- Grid connected renewable electricity generation (version 15).

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Commissioning date of the Bugoye 13.0 MW Run-of-River Hydropower was 7 October 2009, although supply of electricity to the UETCL grid started in September 2009 (test runs of the plant prior to official commissioning). All operations are at one single site and within an integrated physical facility.

The plant has been operating continuously since September 2009 to the present day, with the exception of operational and unanticipated shutdowns, which are fully reported in the “Downtime reports” for each year.

During the monitoring period, the hydropower plant has been operating continuously, with the exception of operational and unanticipated shutdowns, which are fully reported in the “Downtime reports” for 2009 and 2010. In total, during 2009, 143 and 91 downtimes were recorded for Turbine-Generator group 1 (TG1) and Turbine-Generator group 2 (TG2) respectively. During 2010, 614 and 409 downtimes were recorded for Turbine-Generator group 1 (TG1) and Turbine-Generator group 2 (TG2) respectively. It should be noted however that downtimes are recorded over 24 hour periods, so the same event which spans two separate days is recorded as two separate events. Downtimes are divided into five different categories:

- Forced outage of plant (FP)
- Scheduled outage of plant (SP)
- Forced outage of grid (FG)
- Scheduled outage of grid (SG)
- Force majeure (FM) e.g. low water level in the river

Figure 1 below indicates a simple single-line diagram of the project activity with the main monitoring points.

Figure 1: Project single-line diagram

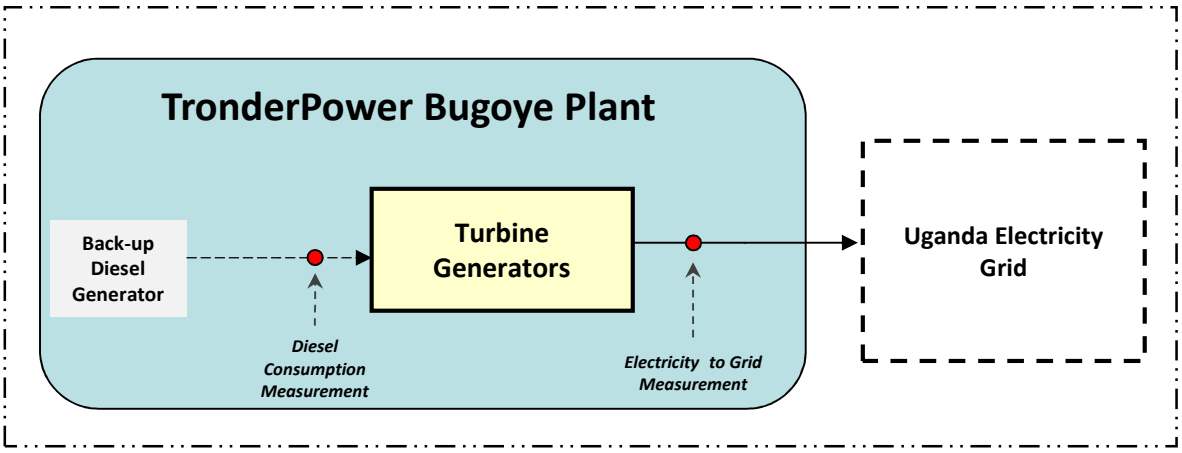


Table I summarizes the number and category of downtime events for 2009, and Table II summarizes the number and category of downtime events for 2010.

Table I: Number and category of downtime events for 2009

Category of event	Unit	
	TG1	TG2
Forced outage of plant	66	40
Scheduled outage of plant	10	18
Forced outage of grid	11	9
Scheduled outage of grid	0	0
Force majeure	56	24
Total	**143**	**91**

Table II: Number and category of downtime events for 2010

Category of event	Unit	
	TG1	TG2
Forced outage of plant	360	192
Scheduled outage of plant	72	43
Forced outage of grid	110	57
Scheduled outage of grid	0	1
Force majeure	72	116
Total	**614**	**409**

The downtime reports for 2009 and 2010 are provided as an annex, and detail the date and time of each event, duration, type (category), equipment affected, description of problem, actions taken and production loss.

The overall electricity production (as supplied to UETCL) totaled 15,805 MWh and 66,359 MWh during 2009 and 2010 respectively. Electricity production during 2009 therefore amounted to 26% of the planned annual production (82,000 MWh), which considering that the plant only started operation and delivery of electricity to the grid in the month of September, operations at the plant can be considered to be consistent with planned production. Electricity production during 2010

amounted to approximately 81% of the planned annual production (82,000 MWh). This lower than planned production was primarily due to a significant number of plant outages.

No events during the monitoring period affected the applicability of the methodology.

2.2 Project Description Deviations

With respect to the registered monitoring plan, the following should be highlighted:

- Calibration of the main and check meters was stated in the CDM-PDD as having to be undertaken annually. Since the project has been implemented it has become apparent that there is no relevant expertise in Uganda needed to undertake the calibration of the said meters. The meter manufacturers (CEWE instruments) have confirmed that the installed meters, following initial test and calibration, do not require any further or regular calibration. For this reason, annual calibration, which is not considered to be required and which cannot be undertaken locally, has not been implemented. It should be mentioned that there has been a continuous check of the readings of the Main Meter vis-à-vis the Check Meter in order to ensure the accuracy of the Main Meter. The meter readings have been performed in the presence of the UETCL representatives (as purchaser of the generated electricity) and all of the invoices have been approved by UETCL and paid.
- The overall responsibility for monitoring and reporting issues lies with TronderPower Ltd and Erling Legran, the Managing Director of the company. Mr Erling Legran replaces Mr Jon Einar Værnes who was originally named in the CDM-PDD.

2.3 Grouped Project

Not applicable.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Parameters for the "Tool to calculate the emissions factor for an electrical system"

Data / Parameter:	**$FC_{i,m,y}$**
Data unit:	Mass or volume unit
Description:	Amount of fossil fuel type *i* consumed by power plant *m* in year *y* (for calculation of $EF_{EL,m,y}$)
Source of data used:	Utility official publications, collected from UETCL, See Annex 3

<table>
<tr><td>Value applied:</td><td>For operating margin:
<table>
<tr><td colspan="2"></td><td>$FC_{i,m,y}$, 1000 litres</td></tr>
<tr><td rowspan="2">2005</td><td>LGGO Aggreko 1</td><td>37,724</td></tr>
<tr><td>Kiira Agrekko 2</td><td>-</td></tr>
<tr><td rowspan="2">2006</td><td>LGGO Aggreko 1</td><td>83,970</td></tr>
<tr><td>Kiira Agrekko 2</td><td>13,203</td></tr>
<tr><td rowspan="2">2007</td><td>LGGO Aggreko 1</td><td>73,989</td></tr>
<tr><td>Kiira Agrekko 2</td><td>70,445</td></tr>
</table>
For build margin:
<table>
<tr><td colspan="2"></td><td rowspan="2">$FC_{i,m,y}$, 1000 litres</td></tr>
<tr><td>Power plants</td><td>Start of operation</td></tr>
<tr><td>Kakira Sugar Works KSW)</td><td>2007</td><td>-</td></tr>
<tr><td>50*KIIRA Aggreko</td><td>2006</td><td>70,445</td></tr>
<tr><td>20*LGGO Aggreko</td><td>2005</td><td>29,596</td></tr>
<tr><td>Total</td><td></td><td>100,051</td></tr>
</table></td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures actually used:</td><td>• OM: Most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (2005-2007)
• BM: For the first crediting period, once ex-ante, following the guidance included in step 6. Sample group of power units according to option (b) representing 20.44% of system generation</td></tr>
<tr><td>Any comment:</td><td>Calculation of the simple adjusted OM in cases where fuel consumption data is available for all power plants / units</td></tr>
</table>

Data / Parameter:	**$EF_{CO2,i,y}$**
Data unit:	tCO_2/TJ
Description:	CO_2 emission factor of fossil fuel type *i* in year *y*

<table>
<tr><td>Source of data used:</td><td>The following data sources may be used if the relevant conditions apply:

<table><tr><th>Data source</th><th>Conditions for using the data source</th></tr><tr><td>Values provided by the fuel supplier of the power plants in invoices</td><td>If data is collected from power plant operators (e.g. utilities)</td></tr><tr><td>Regional or national average default values</td><td>If values are reliable and documented in regional or national energy statistics / energy balances</td></tr><tr><td>IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td></td></tr></table>
Neither values from fuel supplier nor regional / national values are available, so the IPCC default values are used.</td></tr>
<tr><td>Value applied:</td><td>72.6 tCO_2/TJ</td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures actually used:</td><td>IPCC standard for diesel (lower limit of uncertainty at 95%) used as values are not available by fuel supplier and no reliable national default values are available</td></tr>
<tr><td>Any comment:</td><td>--</td></tr>
</table>

Data / Parameter:	**$EG_{m,y}$, $EG_{k,y}$**
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant / unit *m or k* in year *y*
Source of data used:	Most recent 3 years data (2005-2007) collected from Electricity Regulatory Authority (ERA) and Uganda Electricity Transmission Company Limited (UETCL), see Annex 3.

<table>
<tr><td>Value applied:</td><td>For operating margin:
<table>
<tr><th colspan="2"></th><th>Gen ($EG_{m,y}$), MWh</th></tr>
<tr><td rowspan="2">2005</td><td>LGGO Aggreko 1</td><td>140,911</td></tr>
<tr><td>Kiira Agrekko 2</td><td>-</td></tr>
<tr><td rowspan="2">2006</td><td>LGGO Aggreko 1</td><td>319,320</td></tr>
<tr><td>Kiira Agrekko 2</td><td>50,137</td></tr>
<tr><td rowspan="2">2007</td><td>LGGO Aggreko 1</td><td>272,995</td></tr>
<tr><td>Kiira Agrekko 2</td><td>266,437</td></tr>
</table>
For build margin:
<table>
<tr><th colspan="2"></th><th rowspan="2">Gen ($EG_{m,y}$), MWh</th></tr>
<tr><th>Power plants</th><th>Start of operation</th></tr>
<tr><td>Kakira Sugar Works KSW)</td><td>2007</td><td>1,828</td></tr>
<tr><td>50*KIIRA Aggreko</td><td>2006</td><td>266,437</td></tr>
<tr><td>20*LGGO Aggreko</td><td>2005</td><td>109,198</td></tr>
<tr><td>Total</td><td></td><td>377,463</td></tr>
</table></td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures actually used:</td><td>• OM: Most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (2005-2007)
• BM: For the first crediting period, once ex-ante, following the guidance included in step 6. Sample group of power units according to option (b) representing 20.44% of system generation</td></tr>
<tr><td>Any comment:</td><td>--</td></tr>
</table>

<table>
<tr><td>Data / Parameter:</td><td>$NCV_{i,y}$</td></tr>
<tr><td>Unit:</td><td>GJ per tonne</td></tr>
<tr><td>Description:</td><td>Weighted average net calorific value of diesel fuel in year y</td></tr>
<tr><td>Source of data:</td><td>
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source if the carbon fraction of the fuel is not provided (Option A)</td></tr>
<tr><td>b) Measurements by the project participants</td><td>If a) is not available</td></tr>
<tr><td>c) Regional or national default values</td><td>If a) is not available

These sources can only be used for liquid fuels and should be based on well documented, reliable</td></tr>
</table></td></tr>
</table>

	<table><tr><td></td><td>sources.</td></tr><tr><td>d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If a) is not available</td></tr></table> Neither values from fuel supplier nor regional / national values are available, so the IPCC default values are used.
Value of data	41.4TJ/Gg
Brief description of measurement methods and procedures to be applied:	Measurement method not required as d) chosen
QA/QC procedures to be applied (if any):	Any future revision of the IPCC Guidelines will be taken into account
Any comment:	--

Data / Parameter:	**EF_{CO2}**
Unit:	t CO_2e/MWh
Description:	CO_2 Emission Factor for the electricity grid
Source of data:	As determined in the PDD for the "Bugoye 13.0 MW Run-of-River Hydropower Project", and according to the "Tool to calculate the emission factor for an electricity system" (version 02)
Value of data	0.62286 tCO_2/MWh
Brief description of measurement methods and procedures to be applied:	Used for Baseline emission calculations. According to methodology AMS I.D., the baseline emissions are the product of electrical energy produced by the renewable generating unit multiplied by an emission factor: $BE_y = EG_{BL,y} * EF_{CO2}$
QA/QC procedures to be applied (if any):	None
Any comment:	None

3.2 Data and Parameters Monitored

Data Unit / Parameter:	**EGy**
Data unit:	MWh

Description:	Net electricity supplied by the project to the grid
Source of data:	Measurement of energy output meter at the 33 kV side of the transformer that connects to the 33 kV line that evacuates the power to the main grid.
Description of measurement methods and procedures to be applied:	Automatic metering of electricity supplied to UETCL grid through main and check meter, meters read each month. Representatives from UETCL and UMEME, together with a representative from TronderPower (TPL), retrieve historical data for the previous month from each meter by using an optical eye connected to a laptop and the meter.
Frequency of monitoring/recording:	Hourly measurements and monthly recordings of net electricity supplied by the project activity to the grid will be taken.
Value monitored:	82,164.6 MWh
Monitoring equipment:	Specified information for main meter given below: Type: CewePrometerR, 57/99-120/208V, 5A (5mA – 10A), 50Hz, 0.2s, Aux: 40-276 VAC/40-300 VDC (single), I/O:4 inputs and 6 outputs, Com: No communication Accuracy class: 0.2s Serial number: 1641802 Date of last calibration: 10.07.2008
QA/QC procedures to be applied:	Measurement results shall be cross-checked with records for sold electricity (to UETCL).
Calculation method:	Not applicable
Any comment:	None

Data Unit / Parameter:	$\mathbf{FC_{i,j,y}}$
Data unit:	tonne/year
Description:	Quantity of diesel fuel used by site diesel generator during year y
Source of data:	Onsite measurement
Description of measurement methods and procedures to be applied:	Counter on the diesel generator control panel (run-hours meter) monitoring continuously the number of hours the diesel generator has been running multiplied by the consumption rate of the generator (according to manufacturer's specifications).
Frequency of monitoring/recording:	Continuous
Value monitored:	0.846 tonnes/year (2009) 1.830 tonnes/year (2010)
Monitoring equipment:	Fuel counter on control panel (volume meter) monitoring continuously
QA/QC procedures to be	The consistency of metered fuel consumption quantities will

applied:	be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Verified against annual diesel fuel purchase invoices from the financial records.
Calculation method:	Not applicable
Any comment:	Will only be estimated if emissions from the diesel generator equal or exceed 1% of baseline emissions.

Data Unit / Parameter:	$NCV_{i,y}$
Data unit:	GJ per tonne
Description:	Weighted average net calorific value of diesel fuel in year y
Source of data:	Data source / Conditions for using the data source a) Values provided by the fuel supplier in invoices / This is the preferred source if the carbon fraction of the fuel is not provided (Option A) b) Measurements by the project participants / If a) is not available c) Regional or national default values / If a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources. d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories / If a) is not available Neither values from fuel supplier nor regional / national values are available, so the IPCC default values are used.
Description of measurement methods and procedures to be applied:	Measurement method not required as option d) above is chosen (IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories)
Frequency of monitoring/recording:	Not applicable

Value monitored:	43.3 Tj/Gg
Monitoring equipment:	Not applicable
QA/QC procedures to be applied:	Any future revision of the IPCC Guidelines will be taken into account
Calculation method:	Not applicable
Any comment:	None

Data Unit / Parameter:	$\mathbf{EF_{CO2,i,y}}$
Data unit:	tCO_2/GJ
Description:	Weighted average CO2 emission factor of diesel fuel in year y
Source of data:	<table><tr><th>Data source</th><th>Conditions for using the data source</th></tr><tr><td>a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source if the carbon fraction of the fuel is not provided (Option A)</td></tr><tr><td>b) Measurements by the project participants</td><td>If a) is not available</td></tr><tr><td>c) Regional or national default values</td><td>If a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources.</td></tr><tr><td>d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If a) is not available</td></tr></table> Neither values from fuel supplier nor regional / national values are available, so the IPCC default values are used.
Description of measurement methods and procedures to be applied:	Measurement method not required as option d) above is chosen (IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table

	1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories)
Frequency of monitoring/recording:	Not applicable
Value monitored:	7.48 tCO_2/GJ
Monitoring equipment:	Not applicable
QA/QC procedures to be applied:	Any future revision of the IPCC Guidelines will be taken into account
Calculation method:	Not applicable
Any comment:	None

3.3 Description of the Monitoring Plan

The monitoring consists of metering the electricity generated by the renewable technology in line with "I.D. Grid connected renewable electricity generation" and the "Tool to calculate the emission factor for an electricity system".

The monitoring plan ensures that the true, maintainable and measurable GHGs of CDM project can be monitored, recorded and reported. This is the key procedure to determine the CERs. According to monitoring plan, monitoring system should be reliable, conservative and comprehensive; this system should have the function of data evaluation, measurement, and collection and monitoring.

CDM Manager

The overall responsibility for quality assurance of monitoring and reporting issues lies with the CDM Manager in TrønderEnergi Norway. If errors or omissions in the primary data required as part of the CDM monitoring are detected during final QA/QC by CDM Manager in TrønderEnergi Norway, the CDM Manager is responsible for initiating a dialogue with the CDM Director in Kampala to handle these issues, ensuring a conservative approach is selected and taking into account guidance in the relevant CDM methodology, the registered CDM-PDD and any other CDM EB guidance.

CDM Director

The CDM Director in Kampala is responsible for proper quality assurance of all primary data to be utilized for CDM monitoring purposes. Any issues identified regarding primary data used for CDM monitoring detected during initial quality assurance shall without delay be communicated to the CDM Coordinator on site until the issue is resolved.

On a periodical basis the CDM Director shall, subject to having undertaken proper quality control, submit an electronic copy of the consolidated CDM reporting template to the CDM Manager of Trønder Power in Norway.

At the end of each monitoring period, the CDM Director is responsible for reviewing the final dataset to be used as basis for CDM calculations for the monitoring period in consideration. This includes undertaking any relevant consistency checks vis-à-vis operational values. Following finalization of the complete dataset as contained in the CDM Monitoring Model (in excel format), the relevant data for the monitoring period in consideration shall be extracted into a CDM

verification reporting template. Calculations of CDM parameter values, Baseline Emissions, Project Emissions and Emission Reductions relevant for the monitoring period shall be undertaken in line with CDM requirements and presented transparently in the CDM verification reporting template.

The CDM Director is responsible for organizing quarterly internal audits with a pre-notification of the CDM Coordinator. The internal audits include overall quality control of the Monitoring System and ensuring that all the internal specific CDM procedures are followed closely. On annual bases, the CDM Manager shall be involved in the internal audits as well.

CDM Coordinator

The CDM Coordinator on Bugoye is responsible for measurement and recording of all the primary data, including electricity exports to the grid, back-up diesel consumption, down-time events, and all of the supporting measurements and records.

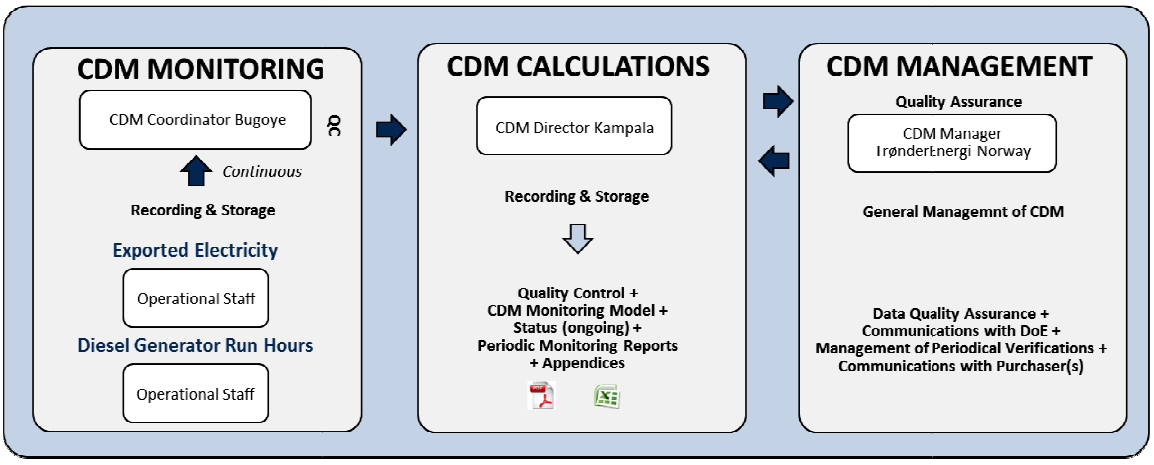
Responsibility holders for the Monitoring Period under consideration in this report

CDM Manager in TrønderEnergi Norway: Mr. Erling Legran (Managing Director)

CDM Director in Kampala: Mrs. Annicent Busingye (General Manager of Tronder Power in Kampala)

CDM Coordinators in Bugoye Power Plant: Mr. Losio Chaplin Lemuresuk (Operational Manager in Bugoye Power Plant)

Figure 2 summarizes, in a visual manner, the monitoring system and how the CDM responsibilities are distributed. Specific CDM procedures have been developed for all of the personnel involved in monitoring to describe the responsibilities and ensure the properness of implementation of the Monitoring Plan.



Meter

One main meter and one check meter system has been installed. The main and check meter, physically installed in the control room at the power house, measure the power flow at the 33 kV side of the transformer (i.e. the output of the transformer) that connects to the 33 kV line that evacuates the power to the main grid.

There is only one line and the meter will be a two-way hourly meter, so each meter reading will be a net reading of power exported/imported to the power station. The main meter and the check meter system installed, owned and maintained by TPL is designed such that the overall error of the installation, (including instrument transformers, wiring, and metering instruments) shall be no greater than 0.2% over the equivalent road range.

All instruments are of the flush mounting type and fitted with nonreflecting glass according to the relevant international standards.

As the main meter, TPL has installed a Cewe Prometer R supplied by Cewe Instrument AB. The Cewe Prometer R is a Precision meter in class 0.2S[4]. The serial number for the main meter is 1641802.

As the check main meter, TPL has installed a Cewe Prometer R supplied by Cewe Instrument AB. The Cewe Prometer R is a Precision meter in class 0.2S. The serial number for the main meter is 1641801.

Testing/calibration

Testing has been carried out by qualified personnel using test equipment with a rated error of ±0.1% or better according to national standards and IEC standards 60521. The test has been carried out for both main and the check meter. The EMH calibration stations are tested by CEWE instruments every 3rd month with EMH KOM200.3. The EMH KOM200.3 Comparator is tested at SP, Swedish National Testing and Research Institute, every 12 months. Test certificates for both main and check meters are provided with the monitoring report.

Recording

Main and Check meter is read at 12:00 on the 2nd day of each month. Representatives from UETCL and UMEME, together with a representative from TronderPower (TPL), retrieve historical data for the previous month from each meter by using an optical eye connected to a laptop and the meter. The data is saved as an excel files. A copy of the data is copied on to a hard copy which is signed by the representatives from UETCL, TPL and UMEME.

Reporting

All readings are reported to UETCL and reading from main meter is used for preparing the invoice. All data required for verification and issuance will be kept for at least two years after the end of the crediting period or the last issuance of CERs of this project, whichever occurs later. The invoice documentation can be used to quality assure report.

Emergency

If the meter is found to be inaccurate for more than two-tenths of a percent (±0,2%) or otherwise function improperly, the TronderPower and UETCL shall jointly prepare an estimate for correct reading.

Training

Key staff have been trained in Norway at the facilities of one of the investors (TrønderEnergi). Before the project was put into operation, the staffs received a training program on operation and metering, both on generally on operation of hydro power plant and specifically on CDM.

With respect to the registered monitoring plan, the following should be highlighted:

[4] For more information, see http://www.ceweinstrument.se/

- Calibration of the main and check meters was stated in the CDM-PDD as having to be undertaken annually. Since the project has been implemented it has become apparent that there is no relevant expertise in Uganda needed to undertake the calibration of the said meters. The meter manufacturers (CEWE instruments) have confirmed that the installed meters, following initial test and calibration, do not require any further or regular calibration. For this reason, annual calibration, which is not considered to be required and which cannot be undertaken locally, has not been implemented.
- The overall responsibility for monitoring and reporting issues lies with TronderPower Ltd and Erling Legran, the Managing Director of the company. Mr Erling Legran replaces Mr Jon Einar Værnes who was originally named in the CDM-PDD.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

According to the CDM methodology AMS I.D., the baseline emissions are 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:

$BE_y = EG_{BL,y} * EF_{CO2}$

Where:

BE_y Baseline Emissions in year y, t CO_2

$EG_{BL,y}$ Energy baseline in year y, kWh

EF_{CO2} CO_2 Emission Factor in year y, t CO_2e/kWh. [5]

Table below summarizes the amount of generated electricity per month and thus the baseline emissions.

SUMMARY OF BASELINE EMISSION REDUCTION CALCULATIONS			
	Generated Electricity *EGy*	**Uganda GEF *EF_{CO2}***	**Baseline ERs**
	MWh	*(tCO_2/MWh)*	*(tCO_{2e})*
October 2009[6]	4,073.29	0.62286	2,537
November 2009	5,977.67	0.62286	3,723
December 2009	5,754.42	0.62286	3,584
January 2010	4,671.56	0.62286	2,910
February 2010	1,836.12	0.62286	1,144
March 2010	6,366.81	0.62286	3,966
April 2010	6,479.74	0.62286	4,036

[5] The CO_2 Emission Factor of the grid was calculated during the validation of the CDM-PDD and could be used for the entire crediting period of the project. The calculated value is 0.62286 tCO_2/MWh.

[6] Please note that the start date of the monitoring period is from October 7, 2009 and hence the electricity generation and consequently emission reduction for the month of October 2009 is considered from October 7, 2009 to October 31, 2009.

May 2010	3,639.54	0.62286	2,267
June 2010	3,759.50	0.62286	2,342
July 2010	4,501.76	0.62286	2,804
August 2010	5,117.77	0.62286	3,188
September 2010	6,795.41	0.62286	4,233
October 2010	8,206.91	0.62286	5,112
November 2010	8,769.53	0.62286	5,462
December 2010	6,214.57	0.62286	3,871

The Emission Factor can be calculated in a transparent and conservative manner as:

a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system" (version 02); OR

b) The weighted average emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

For this project, option a) above was chosen as this will give a more accurate emission factor for the entire crediting period. The Emission Factor was calculated to be 0.62286 tCO_{2e}/MWh; as presented in the PDD for the registered project.

According to the formula above, baseline emissions are calculated as follows:

BE_y = 82,164.6 * 0.62286

BE_y = 51,177 tCO_2e

4.2 Project Emissions

As described in the CDM-PDD, as the Bugoye run-of-river hydropower project does not lead to any emissions due to the operation of geothermal power plants, or from water reservoirs, project emissions, PEy, should equal 0.

As noted in the CDM-PDD, however, a diesel generator has been installed in the plant to provide emergency power in the event of any grid blackouts. The generator was expected to be operating for less than 100 hours a year. Based on a conservative assumption that the generator operates for 100 hrs/yr, it was calculated that the emissions from this source will amount to 19.37 tCO_2/yr, which accounts for less than 0.05% of baseline emissions (see annex 6 of the CDM-PDD).

Nevertheless, fuel consumption of the diesel generator was to be monitored, and if running hours, and therefore fuel consumption, were to increase to a level where emissions from this source will be equal to or exceed 1% of baseline emissions, the electricity generation metered will be adjusted by deducting the electricity generation from fossil fuels using the specific fuel consumption and the quantity of fossil fuel used, as prescribed in AMS I.D. v 15.

The estimation of emissions from the diesel generator presented in Annex 6 of the CDM-PDD is based on a conservative assumption that typical fuel consumption for the said diesel generator is 68.12 l/hr, or 18 USg/hr, as opposed to 18 l/hr, or 4.8 USg/hr, i.e. assumption is made that fuel consumption by diesel generator is over 3.5 times that proposed by manufacturer. Running hours for the diesel generator amounted to 51 hours during 2009 and 110.3 hours during 2010, giving a total of 161.3 hours during the totality of the monitoring period (i.e. 07/10/2009 to 31/12/2010). The estimate made in the CDM-PDD showed that if the generator ran for 100 hrs/yr, total CO_2

emissions from diesel use would amount to 19.37 tCO_2. Based on the estimation of emissions from the diesel generator presented in Annex 6 of the CDM-PDD, emissions from the diesel generator would therefore amount to 31.24 tCO_2/yr (161.3/100 * 19.37). As a percentage of baseline emissions, 31.24 tCO_2/yr represents 0.035% of baseline emissions.

In addition to the above, emissions from the diesel generator can also be verified based on total diesel fuel use. Total diesel used since plant startup on 07 October 2009 to 31 December 2011 (fuel use for 2009 and 2010 alone is not available) amounts to 1950 litres (purchased diesel quantities since start up to 31 December 2011 amounting to 2325 litres, minus stock on 31 December 2011 of 375 litres). Based on a COEF value for diesel ($EF_{CO2,i,y}$) of 7.48 tCO_2/GJ diesel, as given in the CDM-PDD, total CO_2 emissions since project start up amount to:

Amount of diesel used = volume used * density of diesel = 1950 litres * 0.842 t/m^3 = 1.642 t diesel used

Emissions from diesel used = 1.642 t diesel used * 3.24 tCO_2/tonne diesel = 5.32 tCO_2

As a percentage of baseline emissions, 5.32 tCO_2/yr represents 0.01% of baseline emissions.

As stated in the CDM-PDD "if running hours, and therefore fuel consumption, will increase to a level where emissions from this source will be equal to or exceed 1% of baseline emissions, the electricity generation metered will be adjusted by deducting the electricity generation from fossil fuels using the specific fuel consumption and the quantity of fossil fuel used, as prescribed in AMS I.D. v 15.". As emissions from this source have been shown not to equal or exceed 1% of baseline emissions, electricity generation metered is therefore not adjusted.

The below table summarizes calculations of the Project Emissions as well as two ways to verify it.

PROJECT EMISSION CALCULATIONS

According to the CDM-PDD:	*if the generator ran for 100 hrs/yr, total CO_2 emissions from diesel use would amount to 19.37 tCO_2*	
Running hours of the Generator during the entire Monitoring Period	161.3	Hours
Emissions from diesel use	31.24	tonneCO_2
Percentage of Baseline Emissions	0.061%	*This value is far below 1% of the Baseline Emissions so could be set to zero*

Method to verify-Method 1

Running hours of the Generator during the entire Monitoring Period	161.3	Hours
Fuel consumption rate of the diesel generator (Manufacturer's Manual)	18	Litres/Hour
Density of diesel	0.842	Ton/m^3

Diesel emission factor	3.24	tonne CO_2/tonne diesel
Emissions from diesel used	7.92	tonne CO_2
Percentage of Baseline Emissions	0.015%	*This value is far below 1% of the Baseline Emissions so could be set to zero*

Method to verify- Method 2

Total diesel used since plant startup 07/10/2010 - 31/12/2011 (Purchased quantities)	1950	Litres
Density of diesel	0.842	Ton/m^3
Diesel emission factor	3.24	tonneCO_2/tonne diesel
Emissions from diesel used	5.32	tonneCO_2
Percentage of Baseline Emissions	0.010%	*This value is far below 1% of the Baseline Emissions so could be set to zero*

4.3 Leakage

As stated in the CDM-PDD, if the energy generating equipment is transferred from another activity, leakage (LEy) is to be considered. As all generating equipment installed for the project activity is new and not transferred from another activity, it is concluded that LEy = 0.

4.4 Summary of GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$

Where:

ER_y Emission reductions in year y (t CO_2e/y)

BE_y Baseline Emissions in year y (t CO_2e/y)

PE_y Project emissions in year y (t CO_2/y)

LE_y Leakage emissions in year y (t CO_2/y)

Values for the above parameters are summarized in the table below:

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO2e)	Project emissions or actual net GHG removals by sinks (tCO2e)	Leakage (tCO2e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO2e)
October 2009[7]	2,537	0	0	2,537
November 2009	3,723	0	0	3,723
December 2009	3,584	0	0	3,584
January 2010	2,910	0	0	2,910
February 2010	1,144	0	0	1,144
March 2010	3,966	0	0	3,966
April 2010	4,036	0	0	4,036
May 2010	2,267	0	0	2,267
June 2010	2,342	0	0	2,342
July 2010	2,804	0	0	2,804
August 2010	3,188	0	0	3,188
September 2010	4,233	0	0	4,233
October 2010	5,112	0	0	5,112
November 2010	5,462	0	0	5,462
December 2010	3,871	0	0	3,871
Total	51,177	0	0	51,177

Emission reductions for this period are therefore:

ERy = 51,177 - 0 - 0

ERy = 51,177

[7] Please note that the start date of the monitoring period is from October 7, 2009 and hence the electricity generation and consequently emission reduction for the month of October 2009 is considered from October 7, 2009 to October 31, 2009.

5 ADDITIONAL INFORMATION

Additional and supporting information provided with this report as separate documents include:

- Downtime report (log books of turbine generation) for 2009 and 2010

The following documents have been submitted to the DOE separately as a part of the soft copy:

- Test certificates for meters
- Emission Reduction and Project Emission Calculation spreadsheet
- Run hours for diesel generator for 2009 and 2010
- Monthly meter reading records for 2009 and 2010

Downtime Tables

In the below downtime tables, the dates, duration and type of the outage of power plant units are indicated. The duration is indicated in two columns, Hrs:Mins shows the number of hours and minutes that the unit has been down.

Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
29-Oct-09	TG1	00:46	06:24	05:38:00	FP	DE Axial brg.temperature HH
29-Oct-09	TG2	00:46	01:06	00:20:00	FP	Grid failure
29-Oct-09	TG2	12:29	12:44	00:15:00	FG	Grid failure
30-Oct-09	TG1	00:00	06:00	06:00:00	SP	To allow Noremco work on spillway
30-Oct-09	TG1	09:28	10:00	00:32:00	FP	Stuffing box temperature HH
30-Oct-09	TG1	10:14	10:35	00:21:00	FP	Stuffing box temperature HH
30-Oct-09	TG1	11:12	11:24	00:12:00	FM	Low water level in the river
31-Oct-09	TG1	08:46	08:52	00:06:00	FP	Stuffing box temperature HH
06-Nov-09	TG1	00:00	24:00	24:00:00	FM	Low water level in the river
07-Nov-09	TG1	00:00	24:00	24:00:00	FM	Low water level in the river
08-Nov-09	TG1	00:00	24:00	24:00:00	FM	Low water level in the river
09-Nov-09	TG1	00:00	24:00	24:00:00	FM	Low water level in the river
10-Nov-09	TG1	00:00	16:30	16:30:00	FM	WORK GOING ON AT THE SPILLWAY
11-Nov-09	TG1	09:41	09:55	00:14:00	FG	Grid failure
11-Nov-09	TG1	11:25	12:40	01:15:00	FG	Emergency shutdown on main grid. Island mode failed
11-Nov-09	TG2	09:11	09:35	00:24:00	FM	Low water level in the river
11-Nov-09	TG2	11:30	12:40	01:10:00	FM	Emergency shut down by the Grid
11-Nov-09	TG2	13:00	21:40	08:40:00	FM	Mechanical stoppage
12-Nov-09	TG1	14:26	16:20	01:54:00	FM	Low water level in the river
12-Nov-09	TG1	17:50	18:08	00:18:00	FP	Power house flooding
12-Nov-09	TG2	04:21	04:36	00:15:00	FM	Low water level in the river

12-Nov-09	TG2	17:50	18:08	00:18:00	FP	Power house flooding
13-Nov-09	TG1	13:26	14:25	00:59:00	FM	Low water level in the river
14-Nov-09	TG1	02:54	03:06	00:12:00	FM	Low water level in the river
14-Nov-09	TG1	13:30	13:40	00:10:00	FG	Grid failure
14-Nov-09	TG1	17:56	18:09	00:13:00	FM	Low water level in the river
14-Nov-09	TG1	18:50	19:06	00:16:00	FP	Power house flooding
14-Nov-09	TG1	22:29	22:57	00:28:00	FM	Low water level in the river
15-Nov-09	TG1	06:40	15:39	08:59:00	FM	Low water level in the river
15-Nov-09	TG1	17:15	17:46	00:31:00	FM	Low water level in the river
15-Nov-09	TG1	17:56	18:07	00:11:00	FG	Grid failure
15-Nov-09	TG2	02:38	03:50	01:12:00	FM	Low water level in the river
15-Nov-09	TG2	05:05	06:08	01:03:00	FM	Low water level in the river
15-Nov-09	TG2	17:37	18:02	00:25:00	FG	Grid failure
15-Nov-09	TG2	22:50	23:00	00:10:00	FM	Low water level in the river
16-Nov-09	TG1	01:13	02:00	00:47:00	FM	Low water level in the river
16-Nov-09	TG1	03:16	04:30	01:14:00	FM	Low water level in the river
16-Nov-09	TG1	07:33	08:18	00:45:00	FM	Low water level in the river
16-Nov-09	TG1	08:49	09:32	00:43:00	FM	Low water level in the river
16-Nov-09	TG1	10:05	11:28	01:23:00	FM	Low water level in the river
16-Nov-09	TG1	12:09	13:46	01:37:00	FM	Low water level in the river
16-Nov-09	TG1	18:08	18:22	00:14:00	FP	DE Axial brg.temperature HH
16-Nov-09	TG1	18:34	19:16	00:42:00	FP	Power house flooding
16-Nov-09	TG1	19:39	20:08	00:29:00	FP	DE Axial brg.temperature HH
16-Nov-09	TG1	20:18	21:10	00:52:00	FP	DE Axial brg.temperature HH
16-Nov-09	TG1	21:26	22:15	00:49:00	FP	DE Axial brg.temperature HH
16-Nov-09	TG1	22:40	23:11	00:31:00	FP	Stuffing box temperature HH
16-Nov-09	TG1	23:21	23:47	00:26:00	FP	Stuffing box temperature HH
16-Nov-09	TG1	23:56	00:00	00:04:00	FP	Stuffing box temperature HH
16-Nov-09	TG2	00:00	00:25	00:25:00	FM	Low water level in the river
16-Nov-09	TG2	14:40	16:02	01:22:00	FM	Low water level in the river
16-Nov-09	TG2	21:47	22:00	00:13:00	FP	Power house flooding
16-Nov-09	TG2	22:40	22:58	00:18:00	FM	Low water level in the river
17-Nov-09	TG1	00:00	00:08	00:08:00	FP	Power house flooding
17-Nov-09	TG1	00:33	01:08	00:35:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	02:09	02:29	00:20:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	03:13	03:36	00:23:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	03:52	05:01	01:09:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG1	05:36	05:49	00:13:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG1	07:34	07:56	00:22:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	08:04	08:14	00:10:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	08:16	08:20	00:04:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG1	08:49	09:21	00:32:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG1	09:24	09:44	00:20:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	09:45	10:32	00:47:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	11:43	12:06	00:23:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	12:14	12:29	00:15:00	FP	Stuffing box temperature HH
17-Nov-09	TG1	16:20	16:31	00:11:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG2	00:00	00:10	00:10:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG2	00:58	01:10	00:12:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG2	02:22	02:33	00:11:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG2	16:51	17:08	00:17:00	FP	DE Axial brg.temperature HH
17-Nov-09	TG2	20:04	22:43	02:39:00	FP	DE Axial brg.temperature HH
18-Nov-09	TG1	18:31	19:00	00:29:00	FP	DE Axial brg.temperature HH

18-Nov-09	TG1	19:21	19:54	00:33:00	FP	DE Axial brg.temperature HH
18-Nov-09	TG2	08:04	10:41	02:37:00	FP	DE Axial brg.temperature HH
18-Nov-09	TG2	11:27	12:04	00:37:00	FP	Cooling water flowing into stuffing box.
18-Nov-09	TG2	19:21	19:56	00:35:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG1	05:15	05:26	00:11:00	FP	Power house flooding
19-Nov-09	TG1	12:46	13:00	00:14:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG1	14:16	14:31	00:15:00	FG	Grid failure
19-Nov-09	TG1	14:55	15:31	00:36:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG1	15:49	16:44	00:55:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG1	17:00	17:32	00:32:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG1	18:09	18:35	00:26:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG2	05:15	05:26	00:11:00	FP	Power House Flooding
19-Nov-09	TG2	07:38	10:28	02:50:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG2	16:43	16:45	00:02:00	FP	DE Axial brg.temperature HH
19-Nov-09	TG2	16:50	16:55	00:05:00	FP	Cooling water flowing into stuffing box.
19-Nov-09	TG2	18:34	18:53	00:19:00	FP	Cooling water flowing into stuffing box.
20-Nov-09	TG1	23:27	00:00	00:33:00	SP	To allow Noremco work on spillway
21-Nov-09	TG1	00:00	01:02	01:02:00		To allow Noremco work on spillway
21-Nov-09	TG1	01:23	09:40	08:17:00		To allow Noremco work on spillway
23-Nov-09	TG1	00:00	24:00	24:00:00		water level was low
24-Nov-09	TG1	00:00	13:36	13:36:00	FP	Butterfly valve not opening (plastic pipe stuck in wicket gates)
24-Nov-09	TG1	13:46	00:00	10:14:00	FP	Stuffing box temperature HH
24-Nov-09	TG2	13:05	13:33	00:28:00	FP	Cooling water flowing into stuffing box.
24-Nov-09	TG2	15:56	16:12	00:16:00	FP	Cooling water flowing into stuffing box.
25-Nov-09	TG1	21:58	22:33	00:35:00	FP	DE Axial brg.temperature HH
25-Nov-09	TG2	13:05	13:33	00:28:00	FP	Cooling water flowing into stuffing box.
26-Nov-09	TG1	00:00	00:45	00:45:00	FP	DE Axial brg.temperature HH
26-Nov-09	TG1	23:39	00:00	00:21:00	FP	DE Axial brg.temperature HH
26-Nov-09	TG2	18:50	19:24	00:34:00	FG	Grid failure
26-Nov-09	TG2	23:21	23:37	00:16:00	FP	DE Axial brg.temperature HH
27-Nov-09	TG1	05:01	07:45	02:44:00	FP	DE Axial brg.temperature HH
27-Nov-09	TG1	12:33	13:03	00:30:00	FP	DE Axial brg.temperature HH
27-Nov-09	TG2	03:04	05:03	01:59:00	FP	Stuffing box temperature HH
28-Nov-09	TG1	11:05	11:36	00:31:00	FP	Low oil level of the station auxiliary transformer
28-Nov-09	TG1	13:15	14:00	00:45:00	FG	Grid failure
28-Nov-09	TG1	14:18	15:10	00:52:00	FG	Grid failure
28-Nov-09	TG2	12:33	13:03	00:30:00	FG	Grid failure
28-Nov-09	TG2	13:14	14:03	00:49:00	FG	Grid failure
28-Nov-09	TG2	14:18	15:10	00:52:00	FG	Grid failure
28-Nov-09	TG2	15:45	16:38	00:53:00	FM	Low water level in the river
29-Nov-09	TG1	01:41	01:53	00:12:00	SP	To change from standby generator to station transformer
29-Nov-09	TG2	11:05	11:36	00:31:00	SP	Low oil level of the station transformer. Topping up oil
30-Nov-09	TG2	00:59	01:11	00:12:00	FP	Cooling water flowing into stuffing box.
30-Nov-09	TG2	13:52	00:00	10:08:00	SP	To allow work on spill way by avoiding spillage.
01-Dec-09	TG1	17:54	18:04	00:10:00	FG	Grid failure
01-Dec-09	TG2	00:00	02:23	02:23:00	SP	To allow work on spill way by avoiding spillage.
01-Dec-09	TG2	10:16	15:04	04:48:00	SP	To allow work on spill way by avoiding spillage.

01-Dec-09	TG2	15:34	16:15	00:41:00	SP	To allow work on spill way by avoiding spillage.
01-Dec-09	TG2	17:19	18:23	01:04:00	SP	To allow work on spill way by avoiding spillage.
01-Dec-09	TG2	19:09	00:00	04:51:00	SP	To allow work on spill way by avoiding spillage.
02-Dec-09	TG1	10:15	12:28	02:13:00	SP	To allow Noremco work on the spill way without spillage.
02-Dec-09	TG2	00:00	00:00	24:00:00	SP	To allow work on spill way by avoiding spillage.
04-Dec-09	TG1	03:31	03:46	00:15:00	FG	Grid failure
04-Dec-09	TG1	13:56	14:27	00:31:00	SP	To check drainage pump
04-Dec-09	TG1	21:41	21:56	00:15:00	FG	Grid failure
04-Dec-09	TG2	10:14	12:27	02:13:00	SP	To allow work on spill way by avoiding spillage.
04-Dec-09	TG2	12:34	13:49	01:15:00	SP	To allow Noremco work on the spill way without spillage.
04-Dec-09	TG2	13:56	14:26	00:30:00	SP	To allow work on spill way by avoiding spillage. Check the mud drainage.
04-Dec-09	TG2	15:24	17:13	01:49:00	SP	To allow Noremco work on the spill way without spillage.
04-Dec-09	TG2	21:41	21:57	00:16:00	FG	Grid failure
04-Dec-09	TG2	22:24	00:00	01:36:00	FM	Low water level in the river
05-Dec-09	TG1	06:09	06:34	00:25:00	FM	Low water level in the river
05-Dec-09	TG1	14:48	18:41	03:53:00	FM	Low water level in the river
05-Dec-09	TG2	00:00	03:38	03:38:00	FM	Low water level in the river
05-Dec-09	TG2	04:20	14:45	10:25:00	FM	Low water level in the river
06-Dec-09	TG2	11:48	12:06	00:18:00	FM	Low water level in the river
07-Dec-09	TG1	09:36	13:53	04:17:00	FM	Low water level in the river
07-Dec-09	TG1	14:05	14:28	00:23:00	FM	Low water level in the river
07-Dec-09	TG1	14:40	15:52	01:12:00	FM	Low water level in the river
07-Dec-09	TG1	17:21	17:32	00:11:00	FM	Low water level in the river
07-Dec-09	TG2	17:21	17:39	00:18:00	FM	Low water level in the river
07-Dec-09	TG2	18:42	00:00	05:18:00	SP	To allow Noremco work on the spill way without spillage.
08-Dec-09	TG1	00:00	21:07	21:07:00	SP	To allow Noremco work on the spill way without spillage.
08-Dec-09	TG2	00:00	07:43	07:43:00	FM	Low water level in the river
08-Dec-09	TG2	07:43	00:00	16:17:00	SP	To allow Noremco work on the spill way without spillage.
09-Dec-09	TG1	09:41	23:59	14:18:00	SP	To allow Noremco work on the spill way without spillage.
09-Dec-09	TG2	00:00	09:38	09:38:00	SP	To allow Noremco work on the spill way without spillage.
10-Dec-09	TG1	01:02	01:17	00:15:00	FP	DE Axial brg.temperature HH
10-Dec-09	TG2	10:07	21:09	11:02:00	SP	Shutdown
10-Dec-09	TG2	21:09	00:00	02:51:00	FM	Low water level in the river
11-Dec-09	TG1	00:00	00:17	00:17:00	FP	DE Axial brg.temperature HH
11-Dec-09	TG1	01:02	02:09	01:07:00	FP	DE Axial brg.temperature HH
11-Dec-09	TG1	02:22	02:40	00:18:00	FP	DE Axial brg.temperature HH
11-Dec-09	TG1	02:40	23:59	21:19:00	FM	Low water level in the river
11-Dec-09	TG2	00:00	00:59	00:59:00	FM	Low water level in the river
12-Dec-09	TG1	00:17	02:13	01:56:00	FM	Low water level in the river
12-Dec-09	TG1	02:49	03:16	00:27:00	FP	Compressor for the auto filter was not

						running.
13-Dec-09	TG1	02:50	03:15	00:25:00	FM	Low water level in the river
13-Dec-09	TG1	08:27	08:55	00:28:00	FP	DE Axial brg.temperature HH
13-Dec-09	TG1	14:49	15:02	00:13:00	FP	DE Axial brg.temperature HH
13-Dec-09	TG1	20:58	21:10	00:12:00	FP	DE Axial brg.temperature HH
13-Dec-09	TG2	16:48	17:03	00:15:00	FP	Cooling water flowing into stuffing box.
13-Dec-09	TG2	20:55	21:05	00:10:00	FP	DE Axial brg.temperature HH
14-Dec-09	TG1	09:47	14:53	05:06:00	SP	To allow Noremco work on the spill way without spillage.
14-Dec-09	TG1	15:16	23:59	08:43:00	FM	Low water level in the river
14-Dec-09	TG2	07:20	07:32	00:12:00	FP	DE Axial brg.temperature HH
14-Dec-09	TG2	14:41	15:00	00:19:00	FG	Grid failure
15-Dec-09	TG1	08:54	12:43	03:49:00	FM	Low water level in the river
15-Dec-09	TG1	15:44	16:00	00:16:00	SP	Changing the standby generator to the station transformer.
15-Dec-09	TG2	09:18	11:53	02:35:00	SP	Earthing work at the switch yard
15-Dec-09	TG2	15:51	16:13	00:22:00	SP	Changing standby generator power to station transformer.
16-Dec-09	TG1	02:00	02:24	00:24:00	FP	DE Axial brg.temperature HH
16-Dec-09	TG1	13:06	14:43	01:37:00	SP	Frank (ABB) was working on level sensors.
16-Dec-09	TG1	17:18	17:37	00:19:00	FP	DE Axial brg.temperature HH
16-Dec-09	TG1	18:23	18:37	00:14:00	FP	DE Axial brg.temperature HH
16-Dec-09	TG1	19:59	20:13	00:14:00	FP	DE Axial brg.temperature HH
16-Dec-09	TG1	22:44	22:56	00:12:00	FP	Power house flooding
16-Dec-09	TG2	22:45	22:55	00:10:00	FP	Power House flooding
16-Dec-09	TG2	23:45	23:57	00:12:00	FP	Power House flooding
17-Dec-09	TG1	04:16	04:58	00:42:00	FP	DE Axial brg.temperature HH
17-Dec-09	TG1	05:10	06:00	00:50:00	FM	Low water level in the river
17-Dec-09	TG1	14:48	15:06	00:18:00	FG	Grid failure
17-Dec-09	TG2	09:28	10:18	00:50:00	FP	Power house fiooding
17-Dec-09	TG2	14:48	15:06	00:18:00	FG	Grid failure
17-Dec-09	TG2	21:14	21:27	00:13:00	FP	Cooling water flowing into stuffing box.
20-Dec-09	TG1	05:10	05:59	00:49:00	FM	Low water level in the river
20-Dec-09	TG1	06:00	06:39	00:39:00	FM	Low water level in the river
20-Dec-09	TG1	09:02	09:15	00:13:00	FM	Low water level in the river
20-Dec-09	TG1	09:36	11:07	11:05:00	FM	Low water level in the river
20-Dec-09	TG1	11:33	11:46	00:13:00	FP	DE Axial brg.temperature HH
20-Dec-09	TG1	12:33	13:19	00:46:00	FP	DE Axial brg.temperature HH
20-Dec-09	TG1	15:07	15:52	00:45:00	FM	Low water level in the river
21-Dec-09	TG1	00:00	01:16	01:16:00	FM	Low water level in the river
21-Dec-09	TG1	06:26	06:40	00:14:00	FP	Power house flooding
21-Dec-09	TG1	07:34	08:28	00:54:00	FM	Low water level in the river
21-Dec-09	TG1	09:02	09:16	00:14:00	FM	Low water level in the river
21-Dec-09	TG1	09:36	11:08	01:32:00	FM	Low water level in the river
21-Dec-09	TG1	11:33	11:46	00:13:00	FM	Low water level in the river
21-Dec-09	TG1	12:33	14:49	02:16:00	FM	Low water level in the river
21-Dec-09	TG1	15:12	18:11	02:59:00	FM	Low water level in the river
21-Dec-09	TG1	18:55	23:59	05:04:00	FM	Low water level in the river
21-Dec-09	TG2	06:26	06:38	00:12:00	FP	Power house flooding
22-Dec-09	TG1	00:00	05:00	05:00:00	FM	Low water level in the river
22-Dec-09	TG1	15:40	20:30	04:50:00	FM	Low water level in the river
22-Dec-09	TG1	20:55	23:30	02:35:00	FM	Low water level in the river
22-Dec-09	TG1	23:50	00:00	00:10:00	FM	Low water level in the river

22-Dec-09	TG2	15:20	15:35	00:15:00	FP	Penstock presssure low
22-Dec-09	TG2	20:30	20:55	00:25:00	FP	Cooling water flowing into stuffing box.
23-Dec-09	TG1	05:17	06:00	00:43:00	FM	Low water level in the river
23-Dec-09	TG1	06:32	08:45	02:13:00	FM	Low water level in the river
23-Dec-09	TG1	09:03	11:05	02:02:00	FM	Low water level in the river
23-Dec-09	TG1	22:00	00:00	02:00:00	FM	Low water level in the river
23-Dec-09	TG2	02:50	03:30	00:40:00	FP	DE Axial brg.temperature HH
23-Dec-09	TG2	06:00	06:15	00:15:00	FP	Cooling water flowing into stuffing box.
23-Dec-09	TG2	08:45	09:03	00:18:00	FP	Cooling water flowing into stuffing box.
23-Dec-09	TG2	11:05	14:00	02:55:00	FP	Cooling water flowing into stuffing box.
24-Dec-09	TG1	00:00	23:59	23:59:00	FM	Low water level in the river
25-Dec-09	TG1	00:00	06:00	06:00:00	FM	Low water level in the river
26-Dec-09	TG1	00:00	11:45	11:45:00	FP	Pressure imbalance before and after butterfly valve. Presssure after butterfly valve low (14.5) bar). Penstock pressure before butterfly valve 16 bar
27-Dec-09	TG1	04:20	04:30	00:10:00	FM	Penstock pressure low
27-Dec-09	TG1	14:30	16:05	01:35:00	FM	Low water level in the river
27-Dec-09	TG2	18:14	19:24	01:10:00	FM	Low water level in the river
28-Dec-09	TG1	00:00	04:20	04:20:00	FP	Pressure imbalance before and after butterfly valve. Presssure after butterfly valve low (14.5) bar). Penstock pressure before butterfly valve 16 bar
28-Dec-09	TG1	04:30	00:00	19:30:00	FP	Pressure imbalance before and after butterfly valve. Presssure after butterfly valve low (14.5) bar). Penstock pressure before butterfly valve 16 bar
28-Dec-09	TG2	04:20	04:35	00:10:00	FP	Penstock presssure low
28-Dec-09	TG2	08:50	09:08	00:18:00	FP	Station breaker tripped
28-Dec-09	TG2	14:27	14:43	00:16:00	FP	Power house flooding
29-Dec-09	TG1	15:31	17:19	01:48:00	FP	Airbreaker switch opened
29-Dec-09	TG2	15:42	17:29	01:47:00	FM	Low water level in the river
29-Dec-09	TG2	18:17	19:24	01:07:00	FM	Low water level in the river
30-Dec-09	TG2	06:22	07:43	01:21:00	FM	Low water level in the river
30-Dec-09	TG2	08:48	10:10	01:22:00	FM	Low water level in the river
30-Dec-09	TG2	17:29	00:00	06:31:00	FP	Faulty water level sensor at Forebay & the operation is controlled by water level
01-Jan-10	TG1	09:36	10:25	00:49:00	FP	Airbreaker switch opened due to the grid.
01-Jan-10	TG2	10:55	18:44	07:49:00	FM	Low water level
01-Jan-10	TG2	19:05	22:43	03:38:00	FM	Low water level
01-Jan-10	TG2	23:37	00:00	00:23:00	FM	Low water level
02-Jan-10	TG2	00:00	03:09	03:09:00	FM	Low water level
02-Jan-10	TG2	03:36	00:00	20:24:00	FM	Low water level
03-Jan-10	TG1	19:38	20:10	00:32:00	FP	The DE axial temp. was high
03-Jan-10	TG1	20:10	23:59	03:49:00	FM	low water level
03-Jan-10	TG2	00:00	02:54	02:54:00	FM	Low water level
03-Jan-10	TG2	03:31	05:16	01:45:00	FM	Low water level
03-Jan-10	TG2	06:01	10:15	04:14:00	FM	Low water level
03-Jan-10	TG2	10:31	12:18	01:47:00	FM	Low water level
03-Jan-10	TG2	12:32	17:45	05:13:00	FM	Low water level
03-Jan-10	TG2	18:15	19:15	01:00:00	FM	Low water level
04-Jan-10	TG1	00:00	04:20	04:20:00	FM	low water level
04-Jan-10	TG1	07:43	08:18	00:35:00	FG	Main Grid tripped
04-Jan-10	TG1	08:39	16:46	08:07:00	FM	low water level

04-Jan-10	TG2	04:20	08:12	03:52:00	FM	Low water level
04-Jan-10	TG2	16:36	16:58	00:22:00	FG	Under frequency
04-Jan-10	TG2	17:20	00:00	06:40:00	FM	Low water level
05-Jan-10	TG1	12:40	12:48	00:08:00	FP	power house flooding
05-Jan-10	TG1	12:48	00:00	11:12:00	FM	low water level
05-Jan-10	TG2	00:00	12:48	12:48:00	FM	Low water level
06-Jan-10	TG1	00:00	18:17	18:17:00	FM	low water level
06-Jan-10	TG2	18:17	21:00	02:43:00	FP	Stuffing box temp raising,stoped to make adjustment on it.
06-Jan-10	TG2	22:13	00:00	01:47:00	FM	Low water level
07-Jan-10	TG1	00:37	00:44	00:07:00	FP	Guide axial temp high
07-Jan-10	TG1	10:05	18:02	07:57:00	FM	low water level and wanted to test the stuffing temp.
07-Jan-10	TG1	21:14	23:59	02:45:00	FG	Grid was off
07-Jan-10	TG2	00:00	10:00	10:00:00	FM	Low water level
07-Jan-10	TG2	18:26	22:50	04:24:00	FM	Low water level
08-Jan-10	TG1	00:00	04:59	04:59:00	FM	Low water level
08-Jan-10	TG2	04:47	06:20	01:33:00	FP	Power house flooding
08-Jan-10	TG2	06:45	07:50	01:05:00	FM	Low water level
09-Jan-10	TG1	05:40	06:32	00:52:00	FP	PM turb1 governor
09-Jan-10	TG1	06:57	22:09	15:12:00	FM	Low water level
09-Jan-10	TG2	00:00	23:09	23:09:00	FM	Low water level
09-Jan-10	TG2	23:32	00:00	00:28:00	FM	Low water level
10-Jan-10	TG1	15:48	15:53	00:05:00	FG	Over frequency Trip
10-Jan-10	TG1	15:53	17:35	01:42:00	FM	Low water level
10-Jan-10	TG1	20:31	22:23	01:52:00	FM	Low water level
10-Jan-10	TG1	23:05	00:00	00:55:00	FM	Low water level
10-Jan-10	TG2	00:00	00:00	00:00:00	FM	Low water level
11-Jan-10	TG1	00:00	00:00	00:00:00	SP	Penstock inspection
11-Jan-10	TG2	13:18	20:27	07:09:00	SP	Inspection of penstock because it is vibrating
12-Jan-10	TG1	00:00	20:00	20:00:00	SP	Penstock inspection
12-Jan-10	TG1	20:54	00:00	03:06:00	FM	Low water level
12-Jan-10	TG2	00:00	17:05	17:05:00	SP	Inspection of penstock because it is vibrating
13-Jan-10	TG1	00:00	01:50	01:50:00	FM	Low water level
13-Jan-10	TG1	03:01	04:38	01:37:00	FM	Low water level
13-Jan-10	TG2	09:13	09:32	00:19:00	FM	Low water level
14-Jan-10	TG1	00:00	08:35	08:35:00	FG	Main Grid tripped
14-Jan-10	TG2	00:00	09:32	09:32:00	FP	Outlet air temperature high
15-Jan-10	TG1	11:22	14:13	02:51:00	FM	Low water level
15-Jan-10	TG1	19:53	20:53	01:00:00	FM	Low water level
15-Jan-10	TG1	21:51	00:23	02:32:00	FM	Low water level
16-Jan-10	TG1	00:00	16:22	16:22:00	FM	Low water level
17-Jan-10	TG1	00:00	16:15	16:15:00	FP	Penstock pressure imbalance
17-Jan-10	TG1	20:25	00:00	03:35:00	FP	Hydraulic hose joint faulty
17-Jan-10	TG2	16:10	00:00	07:50:00	FM	Low water level
18-Jan-10	TG1	00:01	10:44	10:43:00	FP	Hydraulic hose joint faulty
18-Jan-10	TG2	00:00	12:53	12:53:00	FM	Low water level
19-Jan-10	TG1	11:00	11:56	00:56:00	FG	Over frequency Trip
19-Jan-10	TG1	11:59	13:46	01:47:00	FG	Main Grid tripped
19-Jan-10	TG2	00:00	11:00	11:00:00	FM	Low water level
19-Jan-10	TG2	11:59	16:13	04:14:00	FG	Grid failure
20-Jan-10	TG1	18:15	18:29	00:14:00	FG	Main Grid tripped

20-Jan-10	TG2	00:00	17:24	17:24:00	FM	Low water level
20-Jan-10	TG2	17:56	00:00	06:04:00	FM	Low water level
21-Jan-10	TG1	11:00	11:16	00:16:00	FP	Low grid voltage(32kv).
21-Jan-10	TG1	14:45	14:55	00:10:00	FG	Over/ Under frequency Trip
21-Jan-10	TG1	15:50	16:06	00:16:00	FP	All the submersible pumps failed & injector.
21-Jan-10	TG1	18:19	18:59	00:40:00	FP	Higher water level due to TG1 trip
21-Jan-10	TG2	00:00	16:06	16:06:00	FM	Low water level
21-Jan-10	TG2	18:19	00:00	05:41:00	FM	low water level
22-Jan-10	TG2	00:00	21:58	21:58:00	FM	Low water level
22-Jan-10	TG2	22:37	00:00	01:23:00	FM	Low water level
23-Jan-10	TG2	00:01	00:00	23:59:00	FM	Low water level
24-Jan-10	TG2	00:01	06:49	06:48:00	FM	Low water level
25-Jan-10	TG1	06:49	08:20	01:31:00	FP	Outlet air temperature high
25-Jan-10	TG2	00:01	10:24	10:23:00	FM	Low water level
25-Jan-10	TG2	11:30	00:00	12:30:00	FM	Low water level
26-Jan-10	TG2	00:00	20:23	20:23:00	FM	Low water level
27-Jan-10	TG1	20:15	23:59	03:44:00	FP	Low cooling water flow into turbines. All cooling water pumps faulty
27-Jan-10	TG2	00:00	11:25	11:25:00	FM	Low water level
28-Jan-10	TG1	00:00	23:59	23:59:00	FP	Low cooling water flow inti turbines. All cooling water pumps faulty
29-Jan-10	TG1	00:00	23:59	23:59:00	FP	Low cooling water flow into turbines. All cooling water pumps faulty
30-Jan-10	TG1	00:00	23:59	23:59:00	FP	Low cooling water flow into turbines. All cooling water pumps faulty
30-Jan-10	TG2	11:11	23:59	12:48:00	FG	Over frequency(54 hz)
31-Jan-10	TG2	23:57	00:00	00:03:00	FG	Over frequency(54 hz)
01-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
01-Feb-10	TG2	00:00	23:59	23:59:00	FG	Over frequency(54 hz)
02-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
02-Feb-10	TG2	00:00	02:16	02:16:00	FP	Cooling water into the tubine
02-Feb-10	TG2	02:20	04:40	02:20:00	FP	Cooling water into the tubine
02-Feb-10	TG2	05:20	07:23	02:03:00	FP	Cooling water into the tubine
03-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
04-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
04-Feb-10	TG2	11:10	11:18	00:08:00	SP	Air support by Mavel
05-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
06-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
06-Feb-10	TG2	08:42	09:15	00:33:00	SP	Air support (By Mavel)
06-Feb-10	TG2	09:16	17:21	08:05:00	SP	Marvel shut down
07-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
08-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
08-Feb-10	TG2	16:58	23:59	07:01:00	FP	Cooling water into the tubine
09-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
09-Feb-10	TG2	10:08	23:59	13:51:00	SP	maintenance at the power plant.

10-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
10-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
11-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
11-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
12-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
12-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
13-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
13-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
14-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
14-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
15-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
15-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
16-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
16-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
17-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
17-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
18-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
18-Feb-10	TG2	00:00	23:59	23:59:00	SP	maintenance at the power plant.
19-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
19-Feb-10	TG2	00:00	14:47	14:47:00	SP	maintenance at the power plant.
20-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
20-Feb-10	TG2	00:00	17:27	17:27:00	SP	maintenance at the power plant.
21-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
22-Feb-10	TG1	00:00	23:59	23:59:00	SP	Shutdown for snag list rectification by Mavel/Elprom
22-Feb-10	TG2	06:49	19:17	12:28:00	FG	Over frequency(54 hz)
23-Feb-10	TG1	00:00	16:06	16:06:00	SP	Shutdown for snag list rectification by Mavel/Elprom
23-Feb-10	TG1	16:36	19:36	03:00:00	SP	Shutdown for snag list rectification by Mavel/Elprom
23-Feb-10	TG1	22:21	22:35	00:14:00	FG	Grid freq high (54.9) hz
23-Feb-10	TG2	02:00	22:57	20:57:00	SP	Efficiency test
24-Feb-10	TG1	03:17	03:31	00:14:00	FG	Grid freq high (55.0) hz
24-Feb-10	TG1	05:21	05:32	00:11:00	FP	Bearing temp. high.
24-Feb-10	TG1	06:21	06:31	00:10:00	FG	STUFFING BOX
24-Feb-10	TG1	08:43	16:32	07:49:00	SP	Testing TG2 efficiency
24-Feb-10	TG1	19:22	19:53	00:31:00	FP	Bearing temperature high
24-Feb-10	TG1	21:20	01:25	04:05:00	SP	Testing TG2 efficiency
24-Feb-10	TG2	00:00	00:47	00:47:00	SP	Low water flow in the river
24-Feb-10	TG2	21:18	22:37	01:19:00	SP	Tests
25-Feb-10	TG1	03:51	04:05	00:14:00	FP	Tripped bearing HH
25-Feb-10	TG1	10:15	22:25	12:10:00	SP	Testing TG2 efficiency

25-Feb-10	TG2	01:28	04:27	02:59:00	SP	Efficiency test
26-Feb-10	TG1	02:52	13:59	11:07:00	SP	Eff. Testing
26-Feb-10	TG1	16:00	16:43	00:43:00	SP	Eff. Testing
26-Feb-10	TG1	18:20	18:43	00:23:00	SP	Eff. Testing
26-Feb-10	TG1	19:44	23:59	04:15:00	SP	To run TG2
26-Feb-10	TG2	00:00	06:17	06:17:00	SP	Efficiency test
26-Feb-10	TG2	18:47	20:07	01:20:00	SP	Efficiency test
27-Feb-10	TG1	00:01	00:05	00:04:00	SP	Eff. Testing
27-Feb-10	TG2	06:37	09:57	03:20:00	SP	Drain and remove efficiency test gadget
27-Feb-10	TG2	11:06	11:47	00:41:00	FG	No load at Nkenda
28-Feb-10	TG1	07:08	10:57	03:49:00	FG	No load at Nkenda
28-Feb-10	TG1	16:45	21:20	04:35:00	FG	Grid off
28-Feb-10	TG2	07:36	13:37	06:01:00	FG	No load at Nkenda
01-Mar-10	TG1	08:34	08:38	00:04:00	FP	Penstock pressure Critical Low
01-Mar-10	TG1	08:38	11:46	03:08:00	SP	Mubuku 1 intake under modification.
01-Mar-10	TG1	11:54	12:00	00:06:00	FP	Stuffing box temperature
01-Mar-10	TG1	18:45	20:17	01:32:00	FP	Stuffing box temperature
01-Mar-10	TG2	08:03	08:48	00:45:00	FP	Penstock pressure Critical Low
01-Mar-10	TG2	11:37	12:16	00:39:00	SP	Mubuku 1 intake under modification.
01-Mar-10	TG2	14:17	22:00	07:43:00	FM	Water level low
02-Mar-10	TG1	01:17	02:01	00:44:00	FP	Stuffing box temperature
02-Mar-10	TG1	07:43	08:01	00:18:00	FP	forebay water level critical low
02-Mar-10	TG1	10:14	20:49	10:35:00	FM	low water level
02-Mar-10	TG1	21:29	21:46	00:17:00	FP	Penstock pressure low
02-Mar-10	TG2	07:43	10:22	02:39:00	FP	forebay critical low water level
03-Mar-10	TG1	10:09	13:01	02:52:00	SP	Immergency value ON andOFF Grid operation settings by Mavel.
03-Mar-10	TG1	14:59	16:36	01:37:00	SP	Mubuku 1 intake under modification.
03-Mar-10	TG2	10:41	18:00	07:19:00	SP	Immergency value ON andOFF Grid operation settings by Mavel.
04-Mar-10	TG1	08:25	16:14	07:49:00	SP	Mubuku 1 intake under modification.
04-Mar-10	TG1	18:32	20:28	01:56:00	FP	Axial bearing temp high due filters chocked
04-Mar-10	TG1	21:03	21:20	00:17:00	FP	Axial bearing temp high due filters chocked
04-Mar-10	TG1	21:36	21:53	00:17:00	FP	Axial bearing temp high due filters chocked
04-Mar-10	TG1	22:13	23:41	01:28:00	FP	Axial bearing temp high due filters chocked
04-Mar-10	TG2	16:15	16:30	00:15:00	FP	Axial bearing temp high due chocked filters.
04-Mar-10	TG2	18:31	20:18	01:47:00	FP	Axial bearing temp high due chocked filters.
04-Mar-10	TG2	20:43	21:48	01:05:00	FP	Axial bearing temp high due chocked filters.
04-Mar-10	TG2	22:00	22:13	00:13:00	FP	Axial bearing temp high due chocked filters.
05-Mar-10	TG1	00:00	00:59	00:59:00	FP	Axial bearing temp high due filters chocked
05-Mar-10	TG1	01:21	02:58	01:37:00	FP	Axial bearing temp high due filters chocked
05-Mar-10	TG1	06:53	07:09	00:16:00	FP	Axial bearing temp high due filters chocked
05-Mar-10	TG1	07:58	17:45	09:47:00	FP	TG2 Axial bearing temp high
05-Mar-10	TG1	18:25	19:25	01:00:00	FP	Cooling water flow into the turbine
05-Mar-10	TG1	20:00	20:55	00:55:00	FP	HH bearing temperature
05-Mar-10	TG1	21:03	21:22	00:19:00	FP	Cooling water flow into the turbine
05-Mar-10	TG1	21:41	21:59	00:18:00	FP	HH bearing temperature
05-Mar-10	TG2	03:34	07:53	04:19:00	FP	Axial bearing temp high due chocked filters.
05-Mar-10	TG2	17:37	19:27	01:50:00	FP	Axial bearings high temp.
05-Mar-10	TG2	19:52	21:37	01:45:00	FP	Shut down due to cooling water flow into the turbine
05-Mar-10	TG2	21:45	00:00	02:15:00	FP	CB for drainage pumps tripped
06-Mar-10	TG1	07:41	08:57	01:16:00	FP	Low penstock pressure

06-Mar-10	TG1	09:12	13:16	04:04:00	SP	Intake gate closed to enable Noremco to do their work.
06-Mar-10	TG1	13:27	13:52	00:25:00	FP	Stuffing box temperature
06-Mar-10	TG1	13:55	15:26	01:31:00	FP	Stuffing box temperature
06-Mar-10	TG1	15:45	16:40	00:55:00	FP	Stuffing box temperature
06-Mar-10	TG1	16:56	17:25	00:29:00	FP	Stuffing box temperature
06-Mar-10	TG1	17:34	19:13	01:39:00	FP	Stuffing box temperature
06-Mar-10	TG1	19:21	22:11	02:50:00	FP	Stuffing box temperature
06-Mar-10	TG2	00:37	07:56	07:19:00	FP	DE Axial bearing 79.9C
06-Mar-10	TG2	22:04	23:23	01:19:00	FP	DE Axial bearing high.
07-Mar-10	TG1	04:21	15:44	11:23:00	FP	Stuffing box temperature
07-Mar-10	TG1	16:48	17:05	00:17:00	FP	DE Axial bearing temperature 79.9C
07-Mar-10	TG1	17:25	17:58	00:33:00	FP	DE Axial bearing temperature 79.9C
07-Mar-10	TG1	18:27	19:04	00:37:00	FP	DE Axial bearing temperature 79.9C
07-Mar-10	TG1	19:26	19:45	00:19:00	FP	DE Axial bearing temperature 79.9C
07-Mar-10	TG1	20:05	21:10	01:05:00	FP	DE Axial bearing temperature 79.9C
07-Mar-10	TG1	22:36	22:57	00:21:00	FP	DE Axial bearing temperature 79.9C
07-Mar-10	TG2	01:16	06:32	05:16:00	FP	DE Axial bearing 79.9C
07-Mar-10	TG2	15:36	22:00	06:24:00	FP	DE Axial bearing 79.9C
08-Mar-10	TG1	00:55	01:12	00:17:00	FP	DE Axial bearing temperature 79.9C
08-Mar-10	TG2	02:04	03:54	01:50:00	FP	DE Axial bearing temperature 79.9C
08-Mar-10	TG2	04:46	06:37	01:51:00	FP	DE Axial bearing temperature 79.9C
08-Mar-10	TG2	06:51	09:46	02:55:00	FP	DE Axial bearing temperature 79.9C
08-Mar-10	TG2	10:22	12:11	01:49:00	FP	DE Axial bearing temperature 79.9C
08-Mar-10	TG2	12:50	13:45	00:55:00	FP	DE Axial bearing temperature 79.9C
08-Mar-10	TG2	14:07	15:44	01:37:00	FP	Outlet air 1 temp high
08-Mar-10	TG2	16:00	16:27	00:27:00	FP	Outlet air 1 temp high
08-Mar-10	TG2	16:44	17:51	01:07:00	FP	DE Axial bearing temperature 79.9C
09-Mar-10	TG2	00:36	03:15	02:39:00	FP	DE Axial bearing temperature 79.9C
09-Mar-10	TG2	05:51	14:48	08:57:00	SP	shut down
09-Mar-10	TG2	14:57	15:51	00:54:00	FP	DE Axial bearing high.
09-Mar-10	TG2	17:14	19:01	01:47:00	FP	DE Axial bearing temperature 79.9C
09-Mar-10	TG2	19:02	20:28	01:26:00	FP	DE Axial bearing temperature 79.9C
09-Mar-10	TG2	20:51	22:03	01:12:00	FP	DE Axial bearing temperature 79.9C
10-Mar-10	TG2	15:11	16:41	01:30:00	FP	DF Axial bearing temprature 79.3
10-Mar-10	TG2	18:16	20:13	01:57:00	FP	DE Axil temperature
10-Mar-10	TG2	21:21	00:00	02:39:00	FP	DE Axial bearing temperature
11-Mar-10	TG2	00:00	05:00	05:00:00	FP	DE Axial bearing temperature
11-Mar-10	TG2	05:13	17:09	11:56:00	SP	Noremco shut down
12-Mar-10	TG1	06:11	18:52	12:41:00	SP	Noremco shut down
12-Mar-10	TG1	19:22	23:59	04:37:00	FM	Low water flow
12-Mar-10	TG2	05:44	16:39	10:55:00	SP	Noremco shut down
13-Mar-10	TG1	00:00	01:47	01:47:00	FM	Low water flow
13-Mar-10	TG1	02:23	19:00	16:37:00	FM	Low water flow
13-Mar-10	TG1	20:21	20:39	00:18:00	FM	Low water flow
13-Mar-10	TG2	18:55	20:38	01:43:00	FP	Trip due to cooling water flow into the turbine
13-Mar-10	TG2	22:10	00:00	01:50:00	FM	Stopped due to low water level
14-Mar-10	TG1	12:57	13:20	00:23:00	FP	Cooling water flow into the turbine
14-Mar-10	TG2	00:00	16:06	16:06:00	FM	Stopped due to low water level
14-Mar-10	TG2	16:48	21:33	04:45:00	FM	Stopped due to low water level
17-Mar-10	TG1	09:41	10:21	00:40:00	SP	Testing TG2
17-Mar-10	TG1	11:19	21:55	10:36:00	SP	Still testing TG2
17-Mar-10	TG1	22:44	23:59	01:15:00	FM	Low water level

17-Mar-10	TG2	00:00	10:50	10:50:00	FM	Less water in the Canal
18-Mar-10	TG1	00:00	01:25	01:25:00	FM	Low water level
18-Mar-10	TG1	17:37	18:02	00:25:00	FG	132kv went off.
18-Mar-10	TG1	20:25	20:41	00:16:00	FP	HH bearing temperature
18-Mar-10	TG1	21:41	22:17	00:36:00	FP	HH bearing temperature
18-Mar-10	TG1	22:27	22:41	00:14:00	FP	FM 12 common fault
18-Mar-10	TG1	23:15	23:51	00:36:00	FP	HH bearing temperature
18-Mar-10	TG2	01:15	06:40	05:25:00	FG	Power surge on grid
18-Mar-10	TG2	17:21	22:04	04:43:00	FG	132kv line went off
18-Mar-10	TG2	22:09	23:12	01:03:00	FP	stuffing box temperature high
18-Mar-10	TG2	23:43	00:00	00:17:00	FP	stuffing box temperature high
19-Mar-10	TG1	01:15	01:54	00:39:00	FP	HH bearing temperature
19-Mar-10	TG1	02:53	03:39	00:46:00	FP	HH bearing temperature
19-Mar-10	TG2	00:00	20:58	20:58:00	FP	stuffing box temperature high
21-Mar-10	TG1	15:06	15:23	00:17:00	FP	HH bearing temperature
21-Mar-10	TG1	20:50	21:24	00:34:00	FP	HH bearing temperature
21-Mar-10	TG1	21:42	22:00	00:18:00	FP	HH bearing temperature
21-Mar-10	TG1	22:18	22:36	00:18:00	FP	HH bearing temperature
21-Mar-10	TG2	20:41	20:43	00:02:00	FP	33T2 CB tripped
22-Mar-10	TG1	21:30	22:29	00:59:00	FP	HH bearing temperature
22-Mar-10	TG2	19:59	20:49	00:50:00	FP	Cooling water flow into the turbine
23-Mar-10	TG1	00:36	00:53	00:17:00	FP	HH bearing temperature
23-Mar-10	TG1	01:10	01:27	00:17:00	FP	HH bearing temperature
23-Mar-10	TG1	01:40	02:19	00:39:00	FP	HH bearing temperature
23-Mar-10	TG1	03:22	03:39	00:17:00	FP	HH bearing temperature
23-Mar-10	TG1	17:25	18:01	00:36:00	FP	HH bearing temperature
23-Mar-10	TG2	08:28	22:33	14:05:00	SP	ABB work on the breaker spring charging motor & CTs
24-Mar-10	TG1	07:31	07:48	00:17:00	FP	HH bearing temperature
24-Mar-10	TG2	08:05	16:18	08:13:00	FG	Freq fluctuation of grid and finally broken wicket gate protection pin
26-Mar-10	TG1	16:00	16:32	00:32:00	FP	POWER HOUSE FLOODING
26-Mar-10	TG1	17:04	17:20	00:16:00	FP	POWER HOUSE FLOODING
26-Mar-10	TG1	17:42	18:13	00:31:00	FP	HH bearing temperature
26-Mar-10	TG1	18:28	18:43	00:15:00	FP	HH bearing temperature
26-Mar-10	TG1	19:08	19:41	00:33:00	FP	HH bearing temperature
26-Mar-10	TG1	19:59	20:16	00:17:00	FP	HH bearing temperature
26-Mar-10	TG1	21:03	21:30	00:27:00	FP	HH bearing temperature
26-Mar-10	TG2	16:00	17:16	01:16:00	FP	Power house flooding
26-Mar-10	TG2	17:20	19:13	01:53:00	FP	Power house flooding
27-Mar-10	TG1	15:41	16:15	00:34:00	FP	HH bearing temperature
27-Mar-10	TG1	16:36	18:03	01:27:00	FP	HH bearing temperature
27-Mar-10	TG1	18:03	19:03	01:00:00	FP	HH bearing temperature
27-Mar-10	TG1	19:09	19:52	00:43:00	FP	HH bearing temperature
27-Mar-10	TG1	19:57	20:20	00:23:00	FP	HH bearing temperature
27-Mar-10	TG1	20:26	21:18	00:52:00	FP	HH bearing temperature
27-Mar-10	TG1	21:25	22:33	01:08:00	FP	HH bearing temperature
27-Mar-10	TG1	22:45	23:03	00:18:00	FP	HH bearing temperature
27-Mar-10	TG1	23:09	23:59	00:50:00	FP	HH bearing temperature
27-Mar-10	TG2	16:29	20:19	03:50:00	FP	Axial bearing temp, high
27-Mar-10	TG2	20:25	23:27	03:02:00	FP	stuffing box temperature high
28-Mar-10	TG1	00:00	00:44	00:44:00	FP	HH bearing temperature
28-Mar-10	TG1	01:00	02:14	01:14:00	FP	HH bearing temperature
28-Mar-10	TG1	02:20	03:22	01:02:00	FP	HH bearing temperature

28-Mar-10	TG1	04:00	04:56	00:56:00	FP	HH bearing temperature
28-Mar-10	TG1	05:00	06:30	01:30:00	FP	Stuffing box temperature
28-Mar-10	TG1	08:26	08:48	00:22:00	FP	HH bearing temperature
28-Mar-10	TG1	14:12	14:43	00:31:00	FP	HH bearing temperature
28-Mar-10	TG1	16:47	17:28	00:41:00	FP	HH bearing temperature
28-Mar-10	TG1	18:55	19:22	00:27:00	FP	HH bearing temperature
28-Mar-10	TG1	19:53	20:10	00:17:00	FG	33LH1E CB tripped
28-Mar-10	TG1	22:19	22:39	00:20:00	FP	Bearing temperature high
28-Mar-10	TG1	23:31	00:00	00:29:00	FP	Bearing temperature high
28-Mar-10	TG2	04:13	06:18	02:05:00	FP	Axial bearing temp, high
28-Mar-10	TG2	06:21	20:11	13:50:00	FP	stuffing box temperature high
29-Mar-10	TG1	00:00	00:07	00:07:00	FP	Bearing temperature high
29-Mar-10	TG1	00:39	01:06	00:27:00	FP	Bearing temperature high
29-Mar-10	TG1	02:19	03:00	00:41:00	FP	Bearing temperature high
30-Mar-10	TG1	00:22	00:38	00:16:00	FP	Bearing temperature high
31-Mar-10	TG1	01:07	01:24	00:17:00	FP	Bearing temperature high
31-Mar-10	TG1	01:52	02:12	00:20:00	FP	Bearing temperature high
31-Mar-10	TG1	02:28	15:56	13:28:00	FP	Bearing temperature high
31-Mar-10	TG1	17:45	18:50	01:05:00	FP	Bearing temperature high
31-Mar-10	TG1	20:31	20:46	00:15:00	FP	Bearing temperature high
31-Mar-10	TG2	11:05	17:58	06:53:00	FP	Forebay trashrack blocked
01-Apr-10	TG1	04:30	04:53	00:23:00	FP	DE Axial bearing temp. High
01-Apr-10	TG1	17:19	18:06	00:47:00	FG	Grid failure
01-Apr-10	TG1	18:16	18:35	00:19:00	FG	Grid failure
01-Apr-10	TG1	18:45	19:59	01:14:00	FG	Grid failure
01-Apr-10	TG1	20:26	23:59	03:33:00	FG	Grid failure
01-Apr-10	TG2	17:19	23:59	06:40:00	FG	Grid failure
02-Apr-10	TG1	00:00	13:22	13:22:00	FG	Grid failure
02-Apr-10	TG1	14:35	14:50	00:15:00	FP	DE Axial bearing temp. High
02-Apr-10	TG1	15:00	15:25	00:25:00	FP	DE Axial bearing temp. High
02-Apr-10	TG1	15:45	16:14	00:29:00	FP	DE Axial bearing temp. High
02-Apr-10	TG1	17:26	17:43	00:17:00	FP	DE Axial bearing temp. High
02-Apr-10	TG1	20:52	21:15	00:23:00	FP	DE Axial bearing temp. High
02-Apr-10	TG1	21:48	22:15	00:27:00	FP	DE Axial bearing temp. High
02-Apr-10	TG1	23:05	23:31	00:26:00	FP	DE Axial bearing temp. High
02-Apr-10	TG2	00:00	20:38	20:38:00	FG	Grid failure
03-Apr-10	TG1	00:08	00:26	00:18:00	FP	DE Axial bearing temp. High
04-Apr-10	TG1	22:04	22:24	00:20:00	FM	Low water flow
07-Apr-10	TG1	19:54	20:38	00:44:00	FG	Grid failure
07-Apr-10	TG2	19:54	22:09	02:15:00	FG	Grid failure
08-Apr-10	TG1	10:19	10:36	00:17:00	FG	Grid failure
08-Apr-10	TG2	10:19	20:25	10:06:00	FG	Grid failure
12-Apr-10	TG1	08:18	12:28	04:10:00	FM	Low water flow
12-Apr-10	TG1	13:25	14:26	01:01:00	FM	Low water flow
12-Apr-10	TG1	22:00	23:59	01:59:00	FM	Low water flow
12-Apr-10	TG2	14:38	18:27	03:49:00	FP	Leaking TX2
13-Apr-10	TG1	00:00	00:46	00:46:00	FM	Low water flow
13-Apr-10	TG1	02:40	02:56	00:16:00	FP	DE Axial bearing temp. High
13-Apr-10	TG1	06:59	08:43	01:44:00	FG	Grid failure
13-Apr-10	TG1	08:47	09:04	00:17:00	FG	Grid failure
13-Apr-10	TG1	10:49	11:08	00:19:00	FG	Grid failure
13-Apr-10	TG1	13:23	14:13	00:50:00	FM	Low water flow
13-Apr-10	TG1	14:51	15:41	00:50:00	FP	DE Axial bearing temp. High

13-Apr-10	TG1	15:52	19:16	03:24:00	FP	DE Axial bearing temp. High
13-Apr-10	TG1	19:30	20:27	00:57:00	FP	Stuffing box temp HH
13-Apr-10	TG1	20:43	21:06	00:23:00	FP	Stuffing box temp HH
13-Apr-10	TG1	21:11	21:30	00:19:00	FP	Stuffing box temp HH
13-Apr-10	TG1	21:39	22:29	00:50:00	FP	Stuffing box temp HH
13-Apr-10	TG1	22:45	23:01	00:16:00	FP	DE Axial bearing temp. High
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
13-Apr-10	TG1	23:21	23:44	00:23:00	FP	DE Axial bearing temp. High
13-Apr-10	TG1	23:59	00:00	00:01:00	FP	DE Axial bearing temp. High
13-Apr-10	TG2	07:17	15:45	08:28:00	FG	Grid failure
14-Apr-10	TG1	00:00	00:14	00:14:00	FP	DE Axial bearing temp. High
14-Apr-10	TG1	01:03	01:40	00:37:00	FP	DE Axial bearing temp. High
14-Apr-10	TG1	04:36	04:53	00:17:00	FP	DE Axial bearing temp. High
14-Apr-10	TG1	05:45	06:00	00:15:00	FP	DE Axial bearing temp. High
14-Apr-10	TG1	06:38	06:59	00:21:00	FP	DE Axial bearing temp. High
14-Apr-10	TG1	07:16	07:31	00:15:00	FP	DE Axial bearing temp. High
14-Apr-10	TG1	14:12	14:56	00:44:00	FG	Grid failure
14-Apr-10	TG2	14:12	16:53	02:41:00	FG	Grid failure
15-Apr-10	TG1	02:44	03:00	00:16:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	03:22	03:45	00:23:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	04:03	04:22	00:19:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	04:35	04:53	00:18:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	05:16	05:35	00:19:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	05:49	06:14	00:25:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	06:35	07:04	00:29:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	07:11	07:43	00:32:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	08:00	08:26	00:26:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	08:49	09:22	00:33:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	09:52	10:10	00:18:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	10:28	10:41	00:13:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	11:16	11:29	00:13:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	13:29	13:40	00:11:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	14:28	14:50	00:22:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	15:25	15:48	00:23:00	FP	DE Axial bearing temp. High
15-Apr-10	TG1	16:41	17:02	00:21:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	04:31	05:35	01:04:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	06:09	07:15	01:06:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	07:54	09:51	01:57:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	10:18	11:34	01:16:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	13:31	14:40	01:09:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	15:23	17:02	01:39:00	FP	DE Axial bearing temp. High
15-Apr-10	TG2	17:28	18:55	01:27:00	FP	DE Axial bearing temp. High
17-Apr-10	TG1	19:48	20:13	00:25:00	FG	Grid failure
17-Apr-10	TG2	19:48	20:43	00:55:00	FG	Grid failure
18-Apr-10	TG1	00:00	00:28	00:28:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	00:37	00:55	00:18:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	01:00	01:34	00:34:00	FP	Stuffing box temp HH
18-Apr-10	TG1	02:05	02:21	00:16:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	02:28	02:43	00:15:00	FP	Water flow for air coolers

18-Apr-10	TG1	03:06	03:34	00:28:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	03:39	04:10	00:31:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	06:26	07:00	00:34:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	08:22	09:36	01:14:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	09:52	10:40	00:48:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	11:06	11:30	00:24:00	FP	Stuffing box temp HH
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
18-Apr-10	TG1	11:48	12:09	00:21:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	12:36	12:51	00:15:00	FP	DE Axial bearing temp. High
18-Apr-10	TG1	13:06	13:19	00:13:00	FP	DE Axial bearing temp. High
19-Apr-10	TG1	10:31	11:34	01:03:00	FP	DE Axial bearing temp. High
19-Apr-10	TG1	13:51	14:40	00:49:00	FP	DE Axial bearing temp. High
19-Apr-10	TG1	18:20	18:55	00:35:00	FP	Stuffing box temp HH
19-Apr-10	TG1	20:41	20:57	00:16:00	FP	Stuffing box temp HH
19-Apr-10	TG1	21:03	21:28	00:25:00	FP	Stuffing box temp HH
19-Apr-10	TG1	22:24	23:40	01:16:00	FP	DE Axial bearing temp. High
19-Apr-10	TG1	23:42	00:00	00:18:00	FP	DE Axial bearing temp. High
19-Apr-10	TG2	14:25	15:20	00:55:00	FP	DE Axial bearing temp. High
19-Apr-10	TG2	15:50	22:50	07:00:00	FP	DE Axial bearing temp. High
19-Apr-10	TG2	23:25	00:00	00:35:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	00:00	00:07	00:07:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	00:11	00:27	00:16:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	00:35	01:22	00:47:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	01:30	01:50	00:20:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	02:19	02:38	00:19:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	02:51	03:53	01:02:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	04:10	04:42	00:32:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	04:58	05:14	00:16:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	05:27	05:50	00:23:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	06:06	06:51	00:45:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	07:31	08:13	00:42:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	08:50	10:20	01:30:00	FP	DE Axial bearing temp. High
20-Apr-10	TG1	12:03	12:48	00:45:00	FP	Stuffing box temp HH
20-Apr-10	TG1	14:18	15:08	00:50:00	FP	Stuffing box temp HH
20-Apr-10	TG1	15:18	15:56	00:38:00	FP	Stuffing box temp HH
20-Apr-10	TG2	00:00	00:43	00:43:00	FP	DE Axial bearing temp. High
20-Apr-10	TG2	00:47	02:00	01:13:00	FP	DE Axial bearing temp. High
20-Apr-10	TG2	02:06	04:55	02:49:00	FP	DE Axial bearing temp. High
20-Apr-10	TG2	05:22	07:10	01:48:00	FP	DE Axial bearing temp. High
20-Apr-10	TG2	12:01	16:53	04:52:00	FP	DE Axial bearing temp. High
21-Apr-10	TG1	04:25	04:43	00:18:00	FP	DE Radial bearing temp. High
21-Apr-10	TG2	14:00	18:33	04:33:00	FP	DE Axial bearing temp. High
21-Apr-10	TG2	19:33	23:38	04:05:00	FP	DE Axial bearing temp. High
22-Apr-10	TG1	00:00	00:03	00:03:00	FP	DE Radial bearing temp. High
22-Apr-10	TG1	16:48	17:06	00:18:00	FG	Grid failure
22-Apr-10	TG1	20:25	20:42	00:17:00	FP	DE Radial bearing temp. High
22-Apr-10	TG1	20:57	21:20	00:23:00	FP	DE Radial bearing temp. High
22-Apr-10	TG2	03:58	12:56	08:58:00	FP	DE Axial bearing temp. High
22-Apr-10	TG2	16:48	23:59	07:11:00	FG	Grid failure

23-Apr-10	TG1	06:34	07:03	00:29:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	07:38	08:01	00:23:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	08:14	09:49	01:35:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	09:56	10:41	00:45:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	11:14	13:25	02:11:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	13:29	17:00	03:31:00	FP	DE Radial bearing temp. High
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
23-Apr-10	TG1	17:22	17:57	00:35:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	18:10	19:10	01:00:00	FP	DE Radial bearing temp. High
23-Apr-10	TG1	19:31	20:05	00:34:00	FP	DE Radial bearing temp. High
23-Apr-10	TG2	00:00	23:59	23:59:00	FP	DE Axial bearing temp. High
24-Apr-10	TG1	10:59	11:15	00:16:00	FP	Powerhouse flooding
24-Apr-10	TG1	11:17	11:56	00:39:00	FP	CCT BREAKER OPENED
24-Apr-10	TG1	11:58	13:43	01:45:00	FP	DE Radial bearing temp. High
24-Apr-10	TG2	00:00	18:11	18:11:00	FP	DE Axial bearing temp. High
25-Apr-10	TG1	18:50	19:19	00:29:00	FP	DE Radial bearing temp. High
25-Apr-10	TG2	00:00	18:59	18:59:00	FP	DE Axial bearing temp. High
25-Apr-10	TG2	19:03	23:07	04:04:00	FP	DE Radial bearing temp. High
25-Apr-10	TG2	23:27	00:00	00:33:00	FP	DE Radial bearing temp. High
26-Apr-10	TG1	00:50	01:08	00:18:00	FG	Grid failure
26-Apr-10	TG1	18:41	19:24	00:43:00	FG	Grid failure
26-Apr-10	TG2	01:20	19:24	18:04:00	FP	DE Radial bearing temp. High
26-Apr-10	TG2	19:26	22:29	03:03:00	FP	Wicket gate protection pin broken
26-Apr-10	TG2	22:44	23:58	01:14:00	FP	DE Radial bearing temp. High
27-Apr-10	TG1	00:49	01:07	00:18:00	FP	DE Radial bearing temp. High
27-Apr-10	TG1	02:15	02:58	00:43:00	FP	DE Radial bearing temp. High
27-Apr-10	TG1	03:31	03:48	00:17:00	FP	DE Radial bearing temp. High
27-Apr-10	TG1	05:49	06:40	00:51:00	FP	DE Radial bearing temp. High
27-Apr-10	TG1	15:41	16:07	00:26:00	SP	MAVEL tests on lubrication unit
27-Apr-10	TG1	17:49	18:38	00:49:00	FG	Grid failure
27-Apr-10	TG1	20:36	21:13	00:37:00	FP	DE Axial bearing temp. High
27-Apr-10	TG1	22:09	22:51	00:42:00	FP	DE Axial bearing temp. High
27-Apr-10	TG2	00:23	08:52	08:29:00	FP	DE Radial bearing temp. High
27-Apr-10	TG2	15:14	18:31	03:17:00	SP	MAVEL tests on lubrication unit
28-Apr-10	TG1	00:35	01:46	01:11:00	FP	DE Axial bearing temp. High
28-Apr-10	TG1	03:00	03:44	00:44:00	FP	DE Axial bearing temp. High
28-Apr-10	TG1	06:10	07:00	00:50:00	FP	DE Axial bearing temp. High
28-Apr-10	TG1	12:51	13:28	00:37:00	FG	Grid failure
28-Apr-10	TG1	17:08	18:09	01:01:00	FP	DE Axial bearing temp. High
28-Apr-10	TG1	21:21	21:53	00:32:00	FP	DE Axial bearing temp. High
28-Apr-10	TG1	23:44	00:00	00:16:00	FP	DE Axial bearing temp. High
28-Apr-10	TG2	12:51	17:43	04:52:00	FG	Grid failure
28-Apr-10	TG2	18:38	19:37	00:59:00	FP	DE Radial bearing temp. High
28-Apr-10	TG2	19:50	23:53	04:03:00	FP	DE Radial bearing temp. High
29-Apr-10	TG1	00:00	00:19	00:19:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	01:21	01:43	00:22:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	02:58	03:15	00:17:00	FP	DE Radial bearing temp. High
29-Apr-10	TG1	12:01	12:35	00:34:00	FG	Grid failure
29-Apr-10	TG1	13:33	14:03	00:30:00	FP	DE Radial bearing temp. High

29-Apr-10	TG1	14:14	15:02	00:48:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	15:57	16:37	00:40:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	18:20	19:08	00:48:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	19:27	19:40	00:13:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	20:32	20:46	00:14:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	21:23	21:46	00:23:00	FP	DE Axial bearing temp. High
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
29-Apr-10	TG1	21:59	22:11	00:12:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	22:45	23:00	00:15:00	FP	DE Axial bearing temp. High
29-Apr-10	TG1	23:31	23:48	00:17:00	FP	DE Axial bearing temp. High
29-Apr-10	TG2	12:03	13:48	01:45:00	FP	DE Radial bearing temp. High
29-Apr-10	TG2	14:23	16:07	01:44:00	FP	DE Radial bearing temp. High
29-Apr-10	TG2	16:48	18:30	01:42:00	FP	DE Radial bearing temp. High
29-Apr-10	TG2	19:00	21:31	02:31:00	FP	DE Radial bearing temp. High
30-Apr-10	TG1	06:01	06:51	00:50:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	07:41	07:58	00:17:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	08:53	09:19	00:26:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	10:11	10:27	00:16:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	11:10	11:48	00:38:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	14:59	15:20	00:21:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	16:17	18:19	02:02:00	FP	DE Axial bearing temp. High
30-Apr-10	TG1	19:04	23:59	04:55:00	FG	Grid failure
30-Apr-10	TG2	08:54	10:05	01:11:00	FP	DE Radial bearing temp. High
30-Apr-10	TG2	16:19	23:59	07:40:00	FG	Grid failure
01-May-10	TG1	00:00	17:16	17:16:00	FG	Grid failure
01-May-10	TG1	18:48	19:45	00:57:00	FP	DE Axial bearing temp. High
01-May-10	TG1	20:54	21:11	00:17:00	FP	DE Axial bearing temp. High
01-May-10	TG1	21:35	22:00	00:25:00	FP	DE Axial bearing temp. High
01-May-10	TG1	22:14	22:44	00:30:00	FP	DE Axial bearing temp. High
01-May-10	TG1	23:05	23:59	00:54:00	FP	DE Axial bearing temp. High
01-May-10	TG2	00:00	18:59	18:59:00	FG	Grid failure
01-May-10	TG2	19:40	21:05	01:25:00	FP	DE Radial bearing temp. High
01-May-10	TG2	21:50	22:53	01:03:00	FP	DE Radial bearing temp. High
01-May-10	TG2	23:32	00:00	00:28:00	FP	DE Radial bearing temp. High
02-May-10	TG1	00:00	00:05	00:05:00	FP	DE Axial bearing temp. High
02-May-10	TG1	00:33	01:06	00:33:00	FP	DE Axial bearing temp. High
02-May-10	TG1	01:16	02:00	00:44:00	FP	DE Axial bearing temp. High
02-May-10	TG1	03:16	03:51	00:35:00	FP	DE Axial bearing temp. High
02-May-10	TG1	04:10	04:43	00:33:00	FP	DE Axial bearing temp. High
02-May-10	TG1	04:58	05:18	00:20:00	FP	DE Axial bearing temp. High
02-May-10	TG1	05:27	05:56	00:29:00	FP	DE Axial bearing temp. High
02-May-10	TG1	06:19	06:54	00:35:00	FP	DE Axial bearing temp. High
02-May-10	TG1	07:15	08:30	01:15:00	FP	DE Axial bearing temp. High
02-May-10	TG1	09:12	10:18	01:06:00	FP	DE Axial bearing temp. High
02-May-10	TG1	10:46	11:10	00:24:00	FP	DE Axial bearing temp. High
02-May-10	TG1	11:21	12:06	00:45:00	FP	DE Axial bearing temp. High
02-May-10	TG1	12:29	13:40	01:11:00	FP	DE Axial bearing temp. High
02-May-10	TG1	14:09	14:40	00:31:00	FP	DE Axial bearing temp. High
02-May-10	TG1	14:55	15:15	00:20:00	FP	DE Axial bearing temp. High

02-May-10	TG1	15:27	16:16	00:49:00	FP	DE Axial bearing temp. High
02-May-10	TG1	16:33	17:05	00:32:00	FP	DE Axial bearing temp. High
02-May-10	TG1	17:22	18:26	01:04:00	FP	DE Axial bearing temp. High
02-May-10	TG1	18:54	19:58	01:04:00	FP	DE Axial bearing temp. High
02-May-10	TG1	20:37	21:33	00:56:00	FP	DE Axial bearing temp. High
02-May-10	TG1	22:00	22:31	00:31:00	FP	DE Axial bearing temp. High
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
02-May-10	TG1	22:48	23:08	00:20:00	FP	DE Axial bearing temp. High
02-May-10	TG1	23:23	00:00	00:37:00	FP	DE Axial bearing temp. High
02-May-10	TG2	03:17	07:38	04:21:00	FP	DE Radial bearing temp. High
02-May-10	TG2	17:12	19:04	01:52:00	FP	DE Radial bearing temp. High
02-May-10	TG2	19:26	20:31	01:05:00	FP	DE Radial bearing temp. High
02-May-10	TG2	21:45	22:58	01:13:00	FP	DE Axial bearing temp. High
02-May-10	TG2	23:24	00:00	00:36:00	FP	DE Axial bearing temp. High
03-May-10	TG1	00:00	00:31	00:31:00	FP	DE Axial bearing temp. High
03-May-10	TG1	00:45	01:06	00:21:00	FP	DE Axial bearing temp. High
03-May-10	TG1	01:54	02:13	00:19:00	FP	DE Axial bearing temp. High
03-May-10	TG1	02:31	02:52	00:21:00	FP	DE Axial bearing temp. High
03-May-10	TG1	03:22	03:42	00:20:00	FP	DE Axial bearing temp. High
03-May-10	TG1	04:24	04:46	00:22:00	FP	DE Axial bearing temp. High
03-May-10	TG1	05:37	06:44	01:07:00	FP	DE Axial bearing temp. High
03-May-10	TG1	06:47	07:20	00:33:00	FP	DE Axial bearing temp. High
03-May-10	TG1	08:00	08:38	00:38:00	FP	DE Axial bearing temp. High
03-May-10	TG1	09:57	10:29	00:32:00	FP	DE Axial bearing temp. High
03-May-10	TG1	11:47	12:16	00:29:00	FP	DE Axial bearing temp. High
03-May-10	TG1	13:40	14:23	00:43:00	FP	DE Axial bearing temp. High
03-May-10	TG1	16:35	17:04	00:29:00	FP	DE Axial bearing temp. High
03-May-10	TG2	00:46	15:12	14:26:00	FP	DE Axial bearing temp. High
03-May-10	TG2	15:58	17:26	01:28:00	FP	DE Axial bearing temp. High
03-May-10	TG2	18:42	22:40	03:58:00	FP	DE Axial bearing temp. High
04-May-10	TG2	14:34	18:37	04:03:00	FP	DE Axial bearing temp. High
05-May-10	TG1	17:47	18:03	00:16:00	FP	DE Axial bearing temp. High
05-May-10	TG1	18:18	18:56	00:38:00	FP	DE Axial bearing temp. High
05-May-10	TG1	22:07	22:54	00:47:00	FP	DE Axial bearing temp. High
05-May-10	TG2	18:20	21:53	03:33:00	FP	DE Axial bearing temp. High
06-May-10	TG1	00:23	02:00	01:37:00	FP	DE Axial bearing temp. High
06-May-10	TG1	03:29	04:41	01:12:00	FP	DE Axial bearing temp. High
06-May-10	TG1	05:40	06:11	00:31:00	FP	DE Axial bearing temp. High
06-May-10	TG1	08:29	09:03	00:34:00	FP	DE Axial bearing temp. High
06-May-10	TG1	10:04	10:28	00:24:00	FP	DE Axial bearing temp. High
06-May-10	TG1	17:30	17:48	00:18:00	FP	DE Axial bearing temp. High
06-May-10	TG1	19:08	19:39	00:31:00	FP	DE Axial bearing temp. High
06-May-10	TG1	20:03	20:22	00:19:00	FP	DE Axial bearing temp. High
06-May-10	TG1	20:27	21:03	00:36:00	FP	DE Axial bearing temp. High
06-May-10	TG1	21:23	21:46	00:23:00	FP	DE Axial bearing temp. High
06-May-10	TG1	23:19	23:43	00:24:00	FP	DE Axial bearing temp. High
06-May-10	TG2	03:35	09:03	05:28:00	FP	DE Axial bearing temp. High
06-May-10	TG2	09:45	18:04	08:19:00	FP	DE Axial bearing temp. High
06-May-10	TG2	20:03	21:50	01:47:00	FP	DE Axial bearing temp. High

06-May-10	TG2	23:27	00:00	00:33:00	FP	DE Axial bearing temp. High
07-May-10	TG1	00:21	01:30	01:09:00	FP	DE Axial bearing temp. High
07-May-10	TG1	04:41	05:16	00:35:00	FP	DE Axial bearing temp. High
07-May-10	TG1	14:23	15:01	00:38:00	FP	DE Axial bearing temp. High
07-May-10	TG1	17:55	18:33	00:38:00	FP	DE Axial bearing temp. High
07-May-10	TG1	22:26	22:50	00:24:00	FP	DE Axial bearing temp. High
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
07-May-10	TG1	23:41	23:59	00:18:00	FP	DE Axial bearing temp. High
08-May-10	TG1	00:00	00:04	00:04:00	FP	DE Axial bearing temp. High
08-May-10	TG1	00:32	00:53	00:21:00	FP	DE Axial bearing temp. High
08-May-10	TG1	02:08	02:36	00:28:00	FP	DE Axial bearing temp. High
08-May-10	TG1	03:19	04:10	00:51:00	FP	DE Axial bearing temp. High
08-May-10	TG1	06:52	07:51	00:59:00	FP	DE Axial bearing temp. High
08-May-10	TG1	18:27	18:52	00:25:00	FP	DE Axial bearing temp. High
08-May-10	TG2	00:00	01:47	01:47:00	FP	DE Axial bearing temp. High
08-May-10	TG2	02:14	03:38	01:24:00	FP	DE Axial bearing temp. High
08-May-10	TG2	07:06	08:43	01:37:00	FP	DE Axial bearing temp. High
08-May-10	TG2	09:10	10:53	01:43:00	FP	DE Axial bearing temp. High
08-May-10	TG2	12:05	15:10	03:05:00	FP	DE Axial bearing temp. High
08-May-10	TG2	18:28	20:57	02:29:00	FP	DE Axial bearing temp. High
08-May-10	TG2	23:49	23:59	00:10:00	FP	DE Axial bearing temp. High
09-May-10	TG1	18:31	19:26	00:55:00	FP	DE Axial bearing temp. High
09-May-10	TG1	20:42	21:16	00:34:00	FP	DE Axial bearing temp. High
09-May-10	TG1	22:40	23:10	00:30:00	FP	DE Axial bearing temp. High
09-May-10	TG2	00:00	06:07	06:07:00	FP	DE Axial bearing temp. High
09-May-10	TG2	23:43	23:59	00:16:00	FP	DE Axial bearing temp. High
10-May-10	TG1	00:00	00:04	00:04:00	FP	DE Axial brg high
10-May-10	TG1	05:43	06:01	00:18:00	FP	DE Axial brg high
10-May-10	TG1	09:40	09:59	00:19:00	FP	DE Axial brg high
10-May-10	TG1	15:34	16:01	00:27:00	FG	Overfrequency
10-May-10	TG1	21:30	21:47	00:17:00	FP	DE Axial brg high
10-May-10	TG1	22:49	23:07	00:18:00	FP	DE Axial brg high
10-May-10	TG1	23:19	00:00	00:41:00	FP	DE Axial brg high
10-May-10	TG2	01:15	02:42	01:27:00	FP	DE Axial bearing temp high
10-May-10	TG2	06:06	07:09	01:03:00	FP	DE Axial bearing temp high
10-May-10	TG2	07:54	23:59	16:05:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
11-May-10	TG1	06:03	06:21	00:18:00	FP	DE Axial brg high
11-May-10	TG1	08:02	08:28	00:26:00	FP	DE Axial brg high
11-May-10	TG1	15:02	16:15	01:13:00	SP	Request by MAVEL
11-May-10	TG1	17:48	18:11	00:23:00	FP	DE Axial brg high
11-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
12-May-10	TG1	14:24	14:50	00:26:00	FP	Water flow into turbine
12-May-10	TG1	14:50	17:16	02:26:00	FP	One sensor (shear pin) of wicketgate broken
12-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
13-May-10	TG1	14:18	15:33	01:15:00	SP	Shutdown request by MAVEL
13-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling

						system and DE axial bearing.
14-May-10	TG1	14:00	23:59	09:59:00	SP	Shutdown request by MAVEL
14-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
15-May-10	TG1	00:00	23:59	23:59:00	SP	Shutdown request by MAVEL
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
15-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
16-May-10	TG1	00:00	15:25	15:25:00	SP	Shutdown request by MAVEL
16-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
17-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
18-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
19-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
20-May-10	TG1	05:33	05:54	00:21:00	FP	HH Outlet Air temp due to chocked filters
20-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
21-May-10	TG1	14:03	18:29	04:26:00	SP	Shutdown request by MAVEL
21-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
22-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
23-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
24-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
25-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
26-May-10	TG1	14:19	18:51	04:32:00	FG	Grid failure
26-May-10	TG1	19:16	19:33	00:17:00	FG	Grid failure
26-May-10	TG1	23:27	00:00	00:33:00	FG	Grid failure
26-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
27-May-10	TG1	00:00	08:05	08:05:00	FG	Grid failure
27-May-10	TG1	15:16	16:37	01:21:00	FG	Grid failure
27-May-10	TG1	20:17	00:00	03:43:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
27-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
28-May-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
28-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.

29-May-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
29-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
30-May-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
30-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
31-May-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
31-May-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
01-Jun-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
01-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
02-Jun-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
02-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
03-Jun-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
03-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
04-Jun-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
04-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
05-Jun-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
05-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
06-Jun-10	TG1	00:00	23:59	23:59:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
06-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
07-Jun-10	TG1	00:00	19:41	19:41:00	FP	DE axial bearing temp. HH (coupling for AC lubrication pump broken. Bearing suspected damaged)
07-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling

						system and DE axial bearing.
08-Jun-10	TG1	11:15	12:59	01:44:00	SP	MAVEL request to replace Filters and cooler
08-Jun-10	TG1	18:21	18:36	00:15:00	FG	Power Flactuation
08-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
09-Jun-10	TG1	15:00	16:19	01:19:00	SP	MAVEL request to install a more robust oil cooler.
09-Jun-10	TG1	21:56	22:16	00:20:00	FG	Overfrequency from the grid
09-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
10-Jun-10	TG1	11:03	11:36	00:33:00	SP	Modification on oil lube aggregate
10-Jun-10	TG1	14:23	18:27	04:04:00	SP	Changing the lub.pump with one of higher capacity
10-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
11-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
12-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
13-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
14-Jun-10	TG1	18:57	19:17	00:20:00	FG	Overfrequency from the grid
14-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
15-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
16-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
17-Jun-10	TG1	17:43	17:57	00:14:00	FP	Cooling water flow into the turbine
17-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
18-Jun-10	TG1	17:58	18:16	00:18:00	FG	Unit 33H1E opened
18-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
19-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
20-Jun-10	TG1	17:06	17:26	00:20:00	FG	Unit 33H1E opened
20-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
21-Jun-10	TG1	10:38	11:12	00:34:00	FG	Grid failure
21-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
22-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
23-Jun-10	TG2	00:00	23:59	23:59:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
24-Jun-10	TG1	14:06	15:10	01:04:00	SP	Testing the machine by Mavel staffs

24-Jun-10	TG1	15:21	15:58	00:37:00	FP	Tripped due to cooler water into turbine.
24-Jun-10	TG2	00:00	18:09	18:09:00	FP	Breakdown.MAVEL team checking cooling system and DE axial bearing.
25-Jun-10	TG1	14:30	14:51	00:21:00	FP	The unit shut down due to power house flooding
25-Jun-10	TG1	19:13	19:34	00:21:00	SP	Testing TG2 by Mavel staffs
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
25-Jun-10	TG2	00:00	19:00	19:00:00	SP	Testing the unit having worked on the bearing
25-Jun-10	TG2	19:40	22:42	03:02:00	SP	Waiting for final testing
26-Jun-10	TG1	08:45	09:57	01:12:00	SP	Testing TG2 by Mavel staffs
26-Jun-10	TG1	16:37	19:13	02:36:00	SP	Testing TG2 by Mavel staffs
26-Jun-10	TG2	00:01	16:02	16:01:00	SP	MAVEL team testing.
26-Jun-10	TG2	16:10	23:59	07:49:00	SP	MAVEL team testing.
27-Jun-10	TG2	00:01	13:44	13:43:00	SP	MAVEL team testing.
27-Jun-10	TG2	14:14	22:00	07:46:00	SP	MAVEL team testing.
28-Jun-10	TG2	00:47	13:10	12:23:00	FM	LOW WATER LEVEL
28-Jun-10	TG2	21:12	23:59	02:47:00	SP	MAVEL team testing.
29-Jun-10	TG1	12:42	13:54	01:12:00	SP	request from Nkenda to stop the machine
29-Jun-10	TG1	14:28	14:45	00:17:00	FG	Overfrequency from the grid
29-Jun-10	TG2	07:50	23:59	16:09:00	FM	LOW WATER LEVEL
30-Jun-10	TG2	00:00	23:59	23:59:00	FM	LOW WATER LEVEL
01-Jul-10	TG1	01:05	01:22	00:17:00	FG	Grid problem. Unit 33H1E at substation opened
01-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
02-Jul-10	TG1	21:09	21:58	00:49:00	FG	Grid failure (132KV off)
02-Jul-10	TG1	22:07	22:29	00:22:00	FG	Grid failure (132KV off)
02-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
03-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
04-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
05-Jul-10	TG2	00:00	23:59	23:59:00	FP	Breakdown. MAVEL team working on the bearing
06-Jul-10	TG2	00:00	23:59	23:59:00	FP	Breakdown. MAVEL team working on the bearing
07-Jul-10	TG2	00:00	23:59	23:59:00	FP	Breakdown. MAVEL team working on the bearing
08-Jul-10	TG2	00:00	23:59	23:59:00	FP	Breakdown. MAVEL team working on the bearing
09-Jul-10	TG2	00:00	23:59	23:59:00	FP	Breakdown. MAVEL team working on the bearing
10-Jul-10	TG2	00:00	23:59	23:59:00	FP	Breakdown. MAVEL team working on the bearing
11-Jul-10	TG2	00:00	14:29	14:29:00	FP	Breakdown. MAVEL team working on the bearing
12-Jul-10	TG1	11:38	11:53	00:15:00	FP	The unit shut down due to power house flooding
12-Jul-10	TG1	14:51	15:11	00:20:00	SP	Testing TG2 (MAVEL staff)
12-Jul-10	TG2	00:00	15:41	15:41:00	FM	Low water flow in the river
12-Jul-10	TG2	16:09	23:59	07:50:00	FM	Low water flow in the river

13-Jul-10	TG1	11:07	12:07	01:00:00	FG	Grid failure
13-Jul-10	TG1	15:03	16:24	01:21:00	FG	Grid failure
13-Jul-10	TG2	00:00	09:20	09:20:00	FM	Low water flow in the river
14-Jul-10	TG1	11:18	13:49	02:31:00	FG	Grid failure
14-Jul-10	TG2	00:00	13:49	13:49:00	FM	Low water flow in the river
14-Jul-10	TG2	18:23	23:42	05:19:00	FG	Grid problem (Overcurrent trip) .
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
15-Jul-10	TG1	06:28	08:51	02:23:00	FM	Low water flow in the river
15-Jul-10	TG1	10:01	10:20	00:19:00	FM	Low water flow in the river
15-Jul-10	TG1	20:18	23:59	03:41:00	FM	Low water flow in the river
16-Jul-10	TG1	00:00	12:43	12:43:00	FM	Low water flow in the river
16-Jul-10	TG1	14:59	15:26	00:27:00	FM	Low water flow in the river
16-Jul-10	TG2	10:23	12:42	02:19:00	FG	Grid emergency shutdown
17-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
18-Jul-10	TG1	18:37	18:59	00:22:00	FG	Grid problem. Breaker 33LH1E in Bugoye substation opened
18-Jul-10	TG2	00:00	09:52	09:52:00	FM	Low water flow in the river
19-Jul-10	TG1	09:56	17:40	07:44:00	FM	Low water flow in the river
19-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
20-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
21-Jul-10	TG2	12:00	23:59	11:59:00	FM	Low water flow in the river
22-Jul-10	TG1	12:58	21:24	08:26:00	FG	Grid failure
22-Jul-10	TG2	00:00	04:27	04:27:00	FM	Low water flow in the river
23-Jul-10	TG1	15:54	16:13	00:19:00	FG	Grid failure
23-Jul-10	TG1	16:31	16:45	00:14:00	FG	Grid failure
23-Jul-10	TG1	18:32	20:18	01:46:00	FG	Grid failure
23-Jul-10	TG2	00:00	11:13	11:13:00	FM	Low water flow in the river
23-Jul-10	TG2	11:47	16:50	05:03:00	FM	Low water flow in the river
23-Jul-10	TG2	17:20	23:59	06:39:00	FG	Grid failure
24-Jul-10	TG1	10:04	10:28	00:24:00	SP	Tests by UETCL staff
24-Jul-10	TG1	11:01	11:25	00:24:00	SP	Tests by UETCL staff
24-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
25-Jul-10	TG2	00:00	12:54	12:54:00	FM	Low water flow in the river
26-Jul-10	TG1	00:12	08:15	08:03:00	FG	Grid failure
26-Jul-10	TG2	10:00	19:04	09:04:00	FM	Low water flow in the river
26-Jul-10	TG2	19:43	19:59	00:16:00	FM	Low water flow in the river
27-Jul-10	TG2	00:41	06:21	05:40:00	FM	Low water flow in the river
27-Jul-10	TG2	07:18	23:59	16:41:00	FM	Low water flow in the river
28-Jul-10	TG1	12:04	13:14	01:10:00	FM	Low water flow in the river
28-Jul-10	TG2	00:00	15:49	15:49:00	FM	Low water flow in the river
29-Jul-10	TG2	06:35	23:59	17:24:00	FM	Low water flow in the river
30-Jul-10	TG1	15:31	15:46	00:15:00	FG	Grid problem. Unit 33H1E at substation opened
30-Jul-10	TG1	18:57	19:15	00:18:00	FG	Grid problem. Unit 33H1E at substation opened
30-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
31-Jul-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
01-Aug-10	TG1	18:18	18:46	00:28:00	FG	Grid problem. Unit 33H1E at substation

						opened
01-Aug-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
02-Aug-10	TG2	00:00	08:04	08:04:00	FM	Low water flow in the river
03-Aug-10	TG1	08:11	17:15	09:04:00	FM	Low water flow in the river
03-Aug-10	TG1	17:37	18:25	00:48:00	FM	Low water flow in the river
03-Aug-10	TG1	18:54	22:08	03:14:00	FM	Low water flow in the river
03-Aug-10	TG2	00:00	17:35	17:35:00	FM	Low water flow in the river
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
03-Aug-10	TG2	18:13	00:00	05:47:00	FG	Grid problem. Unit 33H1E at substation opened
04-Aug-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
05-Aug-10	TG1	14:24	23:59	09:35:00	FM	Low water flow in the river
05-Aug-10	TG2	00:00	13:58	13:58:00	FM	Low water flow in the river
06-Aug-10	TG1	00:00	13:31	13:31:00	FM	Low water flow in the river
06-Aug-10	TG1	13:55	23:59	10:04:00	FM	Low water flow in the river
06-Aug-10	TG2	13:10	14:25	01:15:00	FG	Grid failure
07-Aug-10	TG1	00:00	23:59	23:59:00	FM	Low water flow in the river
07-Aug-10	TG2	13:54	15:10	01:16:00	FG	Grid failure
08-Aug-10	TG1	00:00	23:59	23:59:00	FM	Low water flow in the river
09-Aug-10	TG1	00:00		00:00:00	FM	Low water flow in the river
11-Aug-10	TG1	17:21	17:42	00:21:00	FG	Grid failure (over current)
11-Aug-10	TG2	17:18	18:18	01:00:00	FG	Grid problem (over current)
12-Aug-10	TG1	04:27	04:58	00:31:00	FG	Grid failure. Transformer breaker at Nkenda tripped due to a fault along Fort Portal feeder.
12-Aug-10	TG1	09:42	10:10	00:28:00	FG	Grid failure (over current)
12-Aug-10	TG2	04:27	10:00	05:33:00	FG	Transformer at Nkenda failed due to fault along Fort Portal feeder.
13-Aug-10	TG1	10:03	10:25	00:22:00	FG	Grid failure (over current)
13-Aug-10	TG1	10:46	12:15	01:29:00	FM	Low water flow in the river
13-Aug-10	TG1	18:29	19:42	01:13:00	FG	Grid failure. Transformer breaker at Nkenda tripped.
13-Aug-10	TG2	10:04	19:33	09:29:00	FG	Grid problem (over current)
14-Aug-10	TG1	19:51	22:43	02:52:00	FG	Grid failure. Transformer breaker at Nkenda tripped.
14-Aug-10	TG2	11:31	22:46	11:15:00	FP	Compressor motor burnt
15-Aug-10	TG1	11:45	12:22	00:37:00	FG	Grid failure. Transformer breaker at Nkenda tripped.
15-Aug-10	TG2	11:45	20:05	08:20:00	FG	Grid failure. Transformer breaker at Nkenda tripped.
15-Aug-10	TG2	21:14	22:24	01:10:00	FM	Low water flow in the river
16-Aug-10	TG2	00:00	18:00	18:00:00	FM	Low water flow in the river
16-Aug-10	TG2	19:10	23:59	04:49:00	FM	Low water flow in the river
17-Aug-10	TG2	00:35	10:02	09:27:00	FM	Low water flow in the river
18-Aug-10	TG2	09:30	14:14	04:44:00	FM	Low water flow in the river
18-Aug-10	TG2	14:54	23:59	09:05:00	FM	Low water flow in the river
19-Aug-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
20-Aug-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
21-Aug-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
22-Aug-10	TG2	00:00	08:53	08:53:00	FM	Low water flow in the river

23-Aug-10	TG1	09:00	23:59	14:59:00	FM	Low water flow in the river
23-Aug-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
24-Aug-10	TG1	00:00	00:07	00:07:00	FM	Low water flow in the river
24-Aug-10	TG1	00:20	00:40	00:20:00	FG	Grid failure
24-Aug-10	TG2	00:00	23:59	23:59:00	FP	Air outlet temp high
25-Aug-10	TG1	11:55	12:30	00:35:00	FG	Grid failure
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
25-Aug-10	TG1	12:44	00:00	11:16:00	FM	Low water flow in the river
25-Aug-10	TG2	00:00	12:34	12:34:00	FM	Low water flow in the river
26-Aug-10	TG1	21:59	22:07	00:08:00	FG	Grid failure
26-Aug-10	TG1	22:07	23:59	01:52:00	FM	Low water flow in the river
26-Aug-10	TG2	17:10	22:07	04:57:00	FP	TG2 failed due to faulty manometer and most of the lube oil got spilled and the minimum level tripped the machine hence restarted TG1
27-Aug-10	TG1	00:00	23:59	23:59:00	FM	Low water flow in the river
28-Aug-10	TG1	00:00	17:21	17:21:00	FM	Low water flow in the river
28-Aug-10	TG2	17:11	23:59	06:48:00	FG	Grid failure
29-Aug-10	TG2	00:00	23:24	23:24:00	FM	Low water flow in the river
30-Aug-10	TG1	16:07	17:03	00:56:00	FM	Low water flow in the river
30-Aug-10	TG1	17:58	18:41	00:43:00	FG	Grid failure
30-Aug-10	TG2	11:17	15:11	03:54:00	FM	Low water flow in the river
30-Aug-10	TG2	17:58	18:05	00:07:00	FG	Grid failure
31-Aug-10	TG2	16:48	20:34	03:46:00	FM	Low water flow in the river
31-Aug-10	TG2	21:29	22:12	00:43:00	FM	Low water flow in the river
01-Sep-10	TG2	08:26	14:34	06:08:00	FM	Low water flow in the river
01-Sep-10	TG2	15:52	16:10	00:18:00	FM	Low water flow in the river
02-Sep-10	TG1	14:15	15:12	00:57:00	FG	Grid failure
02-Sep-10	TG2	14:43	23:00	08:17:00	FG	Grid failure
03-Sep-10	TG2	02:58	07:00	04:02:00	FM	Low water flow in the river
03-Sep-10	TG2	08:20	08:46	00:26:00	FM	Low water flow in the river
04-Sep-10	TG1	08:32	08:45	00:13:00	FG	Grid problem. Unit 33H1E at substation opened
04-Sep-10	TG2	08:33	20:08	11:35:00	FG	Grid problem. Unit 33H1E at substation opened
06-Sep-10	TG1	19:43	20:22	00:39:00	FG	Grid failure
06-Sep-10	TG1	21:36	22:06	00:30:00	FG	Grid failure
06-Sep-10	TG2	19:43	22:01	02:18:00	FG	Grid failure
07-Sep-10	TG2	16:00	21:16	05:16:00	FP	Cooler 400v ac supply failure
08-Sep-10	TG1	08:26	10:04	01:38:00	FP	Clogged filters
10-Sep-10	TG1	13:15	14:09	00:54:00	FP	Stuffing box clogged
10-Sep-10	TG1	23:07	23:59	00:52:00	FP	Cooler water flow into the turbine
10-Sep-10	TG2	20:29	22:04	01:35:00	FP	Stuffing box clogged
11-Sep-10	TG1	00:00	00:27	00:27:00	FP	Cooler water flow into the turbine
11-Sep-10	TG1	08:05	08:40	00:35:00	FP	Clogged filters
11-Sep-10	TG1	21:08	21:51	00:43:00	FP	Stuffing box clogged
11-Sep-10	TG1	22:05	23:08	01:03:00	FP	Stuffing box clogged
12-Sep-10	TG1	08:25	09:30	01:05:00	FP	Cooler water flow into the turbine

12-Sep-10	TG2	03:56	15:10	11:14:00	FP	Cooling water flow into the turbine
13-Sep-10	TG1	20:27	21:05	00:38:00	FP	Stuffing box high temperature high
14-Sep-10	TG1	17:37	18:26	00:49:00	FP	Cooler water flow into the turbine
17-Sep-10	TG2	14:53	16:33	01:40:00	FP	Cooling water flow into the turbine
18-Sep-10	TG1	15:54	16:33	00:39:00	FG	Grid failure (Over current fault on Kasese feeder)
18-Sep-10	TG2	15:54	19:59	04:05:00	FG	Grid problem (frquency spike 55HZ)
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
20-Sep-10	TG2	19:43	20:16	00:33:00	FP	Cooling water flow into the turbine
21-Sep-10	TG2	17:23	18:25	01:02:00	FP	Cooling water flow into the turbine
23-Sep-10	TG1	18:09	18:30	00:21:00	FG	Grid frequency shot up from (50.02 to 54)HZ
23-Sep-10	TG2	18:09	21:31	03:22:00	FG	Grid frequency shot up from (50.02 to 54)HZ
24-Sep-10	TG1	11:32	19:11	07:39:00	FG	Grid problem (132kV line shutdown to install a transformer at Nkonge substation)
24-Sep-10	TG2	02:48	18:11	15:23:00	FM	Low water flow in the river
24-Sep-10	TG2	18:37	23:59	05:22:00	FP	Power house flooding
25-Sep-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
26-Sep-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
27-Sep-10	TG1	09:27	00:00	14:33:00	FM	Low water flow in the river
27-Sep-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
28-Sep-10	TG1	14:57	21:50	06:53:00	FM	Low water flow in the river
28-Sep-10	TG2	22:51	23:23	00:32:00	FM	Low water flow in the river
29-Sep-10	TG1	19:36	22:25	02:49:00	FG	Grid failure
29-Sep-10	TG2	00:00	20:51	20:51:00	FM	Low water flow in the river
30-Sep-10	TG2	10:14	12:32	02:18:00	FM	Low water flow in the river
30-Sep-10	TG2	13:13	23:59	10:46:00	FM	Low water flow in the river
01-Oct-10	TG2	00:00	12:12	12:12:00	FM	Low water flow in the river
02-Oct-10	TG1	12:14	15:19	03:05:00	SP	Black start & Island mode testing
02-Oct-10	TG2	00:00	00:00	00:00:00	FM	Low water flow in the river
03-Oct-10	TG1	12:19	00:00	11:41:00	SP	Black start & Island mode testing
03-Oct-10	TG2	00:00	22:31	22:31:00	SP	Black start & Island mode testing
04-Oct-10	TG1	00:00	08:10	08:10:00	SP	Black start & Island mode testing
06-Oct-10	TG2	10:22	17:30	07:08:00	SP	Black start & Island mode testing
07-Oct-10	TG1	14:24	18:35	04:11:00	SP	Black start & Island mode testing
07-Oct-10	TG2	14:10	14:36	00:26:00	SP	Black start & Island mode testing
08-Oct-10	TG2	13:05	22:23	09:18:00	FG	Grid failure
11-Oct-10	TG1	09:19	10:20	01:01:00	SP	Black start & Island mode testing
11-Oct-10	TG2	09:20	19:53	10:33:00	SP	Black start & Island mode testing
13-Oct-10	TG1	12:35	19:53	07:18:00	FG	Nkenda shutdown
13-Oct-10	TG2	12:35	23:23	10:48:00	FG	Nkenda shutdown
14-Oct-10	TG1	06:49	07:12	00:23:00	FG	Grid problem. Voltage drop from 34.82kV to 32.51kV opened the line breaker in the substation
14-Oct-10	TG2	06:49	17:41	10:52:00	FG	Grid problem. Voltage drop from 34.82kV to 32.51kV opened the line breaker in the substation
14-Oct-10	TG2	18:28	22:00	03:32:00	FP	Cooling water flow into the turbine
15-Oct-10	TG1	08:44	10:30	01:46:00	FG	Grid problem. Lugogo control center called informing Bugoye about a shut down on the

						132kV line.
15-Oct-10	TG1	12:00	13:34	01:34:00	FG	Grid problem.Shut down on the 132kV line.
15-Oct-10	TG1	14:14	15:36	01:22:00	FG	Grid problem.Shut down on the 132kV line.
15-Oct-10	TG2	08:46	15:10	06:24:00	FG	Grid problem. Lugogo control center called informing Bugoye about a shut down on the 132kV line.
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
15-Oct-10	TG2	15:32	19:39	04:07:00	FG	Grid problem. Voltage drop from 34.82kV to 32.51kV opened the line breaker in the substation
17-Oct-10	TG1	07:24	07:56	00:32:00	FG	Grid failure
17-Oct-10	TG1	18:20	18:46	00:26:00	SP	Black start & Island mode testing
17-Oct-10	TG2	01:23	02:19	00:56:00	FP	cooling water flow into the turbine
17-Oct-10	TG2	07:23	18:40	11:17:00	FG	Grid failure
18-Oct-10	TG1	22:26	22:48	00:22:00	FP	Power house flooding
18-Oct-10	TG2	09:07	22:45	13:38:00	FP	cooling water flow into the turbine
19-Oct-10	TG1	04:21	05:09	00:48:00	FP	Cooling water flow into turbine
21-Oct-10	TG2	08:12	18:44	10:32:00	FP	400vac breaker tripped
22-Oct-10	TG1	18:30	18:53	00:23:00	FG	Grid failure from Jinja(Sentongo John from Nkenda).
22-Oct-10	TG2	18:27	18:36	00:09:00	FP	Cooling water flow into the turbine
23-Oct-10	TG1	06:14	06:31	00:17:00	FG	Switching on island mode to enable UETCL staffs to maitain the transmission line
23-Oct-10	TG1	11:25	11:43	00:18:00	FP	Hima feeder opened
23-Oct-10	TG2	06:14	11:44	05:30:00	SG	Switching on island mode to enable UETCL staffs to maitain the transmission line
24-Oct-10	TG1	22:31	23:17	00:46:00	FP	Power house flooding
24-Oct-10	TG1	23:33	23:54	00:21:00	FP	Power house flooding
24-Oct-10	TG2	22:31	23:15	00:44:00	FP	Power house flooding
25-Oct-10	TG2	05:00	18:28	13:28:00	FP	Air coolers temp high
31-Oct-10	TG1	18:08	18:36	00:28:00	FG	circuit breaker 0.4STIE opened(voltage dip, from 35.17kv down to 32.64kv)
31-Oct-10	TG2	18:08	19:57	01:49:00	FP	circuit breaker 0.4STIE opened(voltage dip, from 35.17kv down to 32.64kv)
02-Nov-10	TG1	04:49	05:21	00:32:00	FG	132 kV failed
03-Nov-10	TG1	13:25	13:45	00:20:00	FG	132 kV failed
03-Nov-10	TG2	13:25	13:44	00:19:00	FG	Grid failure
04-Nov-10	TG2	01:31	07:03	05:32:00	FP	Cooling water flow into the turbine
06-Nov-10	TG1	06:47	07:00	00:13:00	FG	Grid shut down by *UETCL*
06-Nov-10	TG1	17:20	17:50	00:30:00	FG	Grid problem. 33kV Kasese feeder tripped on overcurrent
06-Nov-10	TG1	18:30	19:21	00:51:00	FG	Grid problem. 33kV Kasese feeder tripped on overcurrent (Structure and conductors collapsed)
06-Nov-10	TG1	19:50	20:03	00:13:00	FG	Grid problem. 33kV F/Portal feeder tripped
06-Nov-10	TG2	06:47	17:17	10:30:00	FG	Grid shut down by UETCL
06-Nov-10	TG2	18:30	20:03	01:33:00	FG	Grid problem. 33kV F/Portal feeder tripped
07-Nov-10	TG1	06:11	06:27	00:16:00	FG	Grid problem. Reduced generation to balance

						loads at Nkenda to avoid total trip
07-Nov-10	TG1	09:19	09:40	00:21:00	FG	Under frequency (Dip from 50.2 HZ to 45HZ)
07-Nov-10	TG2	09:19	11:56	02:37:00	FG	Under frequency (Dip from 50.2 HZ to 45HZ)
13-Nov-10	TG1	17:25	17:49	00:24:00	FG	Grid failure
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
13-Nov-10	TG1	17:58	18:16	00:18:00	FG	Grid failure
13-Nov-10	TG1	19:44	20:05	00:21:00	FP	Low penstock pressure.Fore bay clogged due to heavy flooding in Esya river
13-Nov-10	TG1	20:56	21:29	00:33:00	FG	Grid failure
13-Nov-10	TG1	22:37	22:56	00:19:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
13-Nov-10	TG1	23:39	00:00	00:21:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
13-Nov-10	TG2	11:13	17:42	06:29:00	FG	Grid issue. UETCL requested for a shut down
13-Nov-10	TG2	17:58	20:38	02:40:00	FG	Grid issue. Hima feeder tripped on overcurrent (Two poles collapsed)
13-Nov-10	TG2	20:56	22:56	02:00:00	FG	Grid failure
14-Nov-10	TG1	01:05	01:26	00:21:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
14-Nov-10	TG1	04:33	05:32	00:59:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
14-Nov-10	TG1	10:03	10:42	00:39:00	FP	Stuffing box temp.(BT321) HH
14-Nov-10	TG2	01:04	05:06	04:02:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
15-Nov-10	TG1	00:25	00:51	00:26:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
15-Nov-10	TG1	01:18	02:18	01:00:00	FP	Water flow into the turbine (Water muddy due to floods in Esya river)
15-Nov-10	TG1	15:06	15:35	00:29:00	FG	Grid failure. Fortportal line.
15-Nov-10	TG2	15:06	00:00	08:54:00	FG	Grid failure. Fortportal line.
16-Nov-10	TG1	00:26	00:46	00:20:00	FP	Hima feeder opened
16-Nov-10	TG2	00:25	16:40	16:15:00	FG	Hima feeder opened
25-Nov-10	TG1	16:22	16:45	00:23:00	FP	Breaker *0.4ST1E*, for auxillary opened on voltage surge(33.67kv to 35.71kv)
25-Nov-10	TG2	16:22	22:47	06:25:00	FP	Breaker 0.4ST1E, for auxillary opened on voltage surge(33.67kv to 35.71kv)
27-Nov-10	TG1	22:28	22:50	00:22:00	FG	Breaker *0.4ST1E*, for auxillary opened on voltage surge(33.67kv to 35.71kv)
27-Nov-10	TG2	22:28	00:00	01:32:00	FP	Breaker 0.4ST1E, for auxillary opened on voltage surge(33.67kv to 35.71kv)
28-Nov-10	TG1	12:49	13:06	00:17:00	FG	Grid failure(KCCL tripped)
28-Nov-10	TG1	13:29	13:57	00:28:00	FG	Grid failure(132kv line)
28-Nov-10	TG2	12:49	13:45	00:56:00	FG	Grid failure(KCCL tripped)
01-Dec-10	TG2	09:10	18:44	09:34:00	SP	MAVEL team testing.
02-Dec-10	TG1	08:57	09:38	00:41:00	SP	MAVEL TESTING ON ISLAND
02-Dec-10	TG1	11:04	11:25	00:21:00	SP	MAVEL TESTING ON ISLAND

02-Dec-10	TG1	12:02	13:20	01:18:00	SP	MAVEL TESTING ON ISLAND
02-Dec-10	TG1	17:35	18:12	00:37:00	SP	MAVEL TESTING ON ISLAND
03-Dec-10	TG1	01:00	01:15	00:15:00	FP	Breaker 0.4ST1E, for auxillary opened on voltage surge(33.67kv to 35.71kv)
03-Dec-10	TG1	09:24	10:55	01:31:00	SP	SAFETY PRACTICAL
03-Dec-10	TG1	18:29	18:43	00:14:00	FP	Breaker 0.4ST1E, for auxillary opened on voltage surge(33.67kv to 35.71kv)
Outage				**Duration**	**Type**	**Problem Description**
Date	**Unit**	**From**	**To**	**Hrs:Mins**	**FP SP FG SG FM**	
03-Dec-10	TG2	18:29	22:09	03:40:00	FP	Breaker 0.4ST1E, for auxillary opened on voltage surge(33.00kv to 35.71kv)
08-Dec-10	TG1	15:35	16:01	00:26:00	FG	Grid failure
08-Dec-10	TG2	15:35	20:37	05:02:00	FG	Grid failure. 132kV line went off on transient and Breaker 0.4ST1E, for auxillary opened
12-Dec-10	TG1	20:21	20:36	00:15:00	FM	Breaker 0.4T1E tripped after fortportal feeder tripping
12-Dec-10	TG2	20:21	22:57	02:36:00	FP	Breaker 0.4T1E tripped after fortportal feeder tripping
13-Dec-10	TG1	10:43	10:59	00:16:00	FM	Breaker 0.4T1E tripped after fortportal feeder tripping
13-Dec-10	TG2	10:43	16:53	06:10:00	FP	Breaker 0.4T1E tripped after fortportal feeder tripping
14-Dec-10	TG1	14:59	16:34	01:35:00	FP	cleaning filters
15-Dec-10	TG2	14:15	22:18	08:03:00	FM	Low water flow in the river
16-Dec-10	TG1	09:16	14:09	04:53:00	FM	Low water flow in the river
16-Dec-10	TG1	17:22	18:57	01:35:00	FM	Low water flow in the river
16-Dec-10	TG1	19:32	23:38	04:06:00	FM	Low water flow in the river
16-Dec-10	TG2	09:14	18:58	09:44:00	FM	Low water flow in the river
16-Dec-10	TG2	19:23	23:59	04:36:00	FM	Low water flow in the river
17-Dec-10	TG1	00:00	08:15	08:15:00	FM	Low water flow in the river
17-Dec-10	TG2	08:45	23:59	15:14:00	FM	Low water flow in the river
18-Dec-10	TG2	00:00	06:19	06:19:00	FM	Low water flow in the river
19-Dec-10	TG1	06:28	23:59	17:31:00	FM	Low water flow in the river
19-Dec-10	TG2	00:00	23:59	23:59:00	FM	Low water flow in the river
20-Dec-10	TG1	00:00	08:59	08:59:00	FM	Low water flow in the river
20-Dec-10	TG2	09:07	12:34	03:27:00	FM	Low water flow in the river
21-Dec-10	TG1	12:25	23:46	11:21:00	FM	Low water flow in the river
21-Dec-10	TG1	23:53	23:59	00:06:00	FG	grid failure
21-Dec-10	TG2	00:00	23:52	23:52:00	FM	Low water flow in the river
22-Dec-10	TG1	00:00	00:16	00:16:00	FG	grid failure
22-Dec-10	TG1	00:34	23:59	23:25:00	FM	Low water flow in the river
23-Dec-10	TG1	00:00	23:59	23:59:00	FM	Low water flow in the river
24-Dec-10	TG1	00:00	23:59	23:59:00	FM	Low water flow in the river
25-Dec-10	TG1	00:00	23:59	23:59:00	FM	Low water flow in the river
26-Dec-10	TG1	00:00	06:52	06:52:00	FM	Low water flow in the river
26-Dec-10	TG1	06:58	07:10	00:12:00	FP	Power house flooding
26-Dec-10	TG2	06:58	15:54	08:56:00	FM	Low water flow in the river
27-Dec-10	TG2	00:00	15:06	15:06:00	FM	Low water flow in the river
31-Dec-10	TG1	14:18	14:40	00:22:00	FG	Tx at Nkenda opened
31-Dec-10	TG2	14:18	21:05	06:47:00	FG	Tx at Nkenda opened

	TG1	TG2
Total hours of Shutdown 2009	**443.3**	**183.8**
Total hours of Shutdown 2010	**2077.9**	**4065.6**