Request for Revision of Registered Monitoring Plan

Subhash Kabini Power Corporation Limited

20MW Kabini Hydro Electric Power Project, SKPCL, India

Reference No. UNFCCC 00000087

M/s Subhash Kabini Power Corporation Limited
8/2, Ulsoor Road,
Bangalore, PIN- 560038,
State- Karnataka, India
Tel: + 91 80 – 41859500
Fax: + 91 80 – 25595580
URL: www.subhashpower.com
e-mail: ganapathy.subramanian@blr.spml.co.in

Project Activity

The CDM project activity is a 20MW renewable energy hydro power project which utilizes the surplus discharge (available primarily during the monsoon period) of the river Kabini for generation of hydro power. The power thus generated is exported to the Karnataka Power Transmission and Corporation Limited (KPTCL) grid after meeting the auxiliary power demand for the power plant equipment.

The CDM project activity has been registered with UNFCCC (Reference No. UNFCCC 00000087) and the Certified Emission Reduction units for the first verification period *i.e.* 24th June 2003 to 30th April 2006 has already been issued.

Proposed Revision

As per the Registered Project Design Document, the baseline emission resulting from the project activity is computed as the product of the 'net electricity supplied by the project activity to KPTCL grid' and the 'KPTCL grid emission factor'.

During registration, the KPTCL grid emission factor has been determined on an ex-ante basis following the guidance of the 'Approved Consolidated Methodology ACM0002/ Version 02: Consolidated methodology for grid-connected electricity generation from renewable sources' for the most recent three years at the time of PDD submission. The first periodic issuance also considers the KPTCL grid emissions factor, as computed ex-ante in the Registered PDD. However the monitoring plan in the Registered PDD has a provision for annual up-dation of the KPTCL grid emission factor (please refer to Section D.2.1.3 of the Registered PDD).

The project proponent proposes to fix up the KPTCL grid emission factor (EF_y), calculated ex-ante at the time of project registration, for the entire crediting period and use the ex-ante emission factor of the KPTCL grid (as given in the Registered PDD) for subsequent verification without adopting for annual up-dation of the same. The revision of the Registered Monitoring Plan is requested with respect to the clarification being raised by the DOE during second periodic verification which states:

"The Build Margin (BM) emission factor description in the Monitoring Plan i.e. Section B.2.Step 3, Page No.21 is based on ex-ante approach as the BM is calculated once at the beginning of the crediting period. Whereas, the BM calculation described in the Section D.2.1.4, Page No.42 is based on ex-post approach i.e. BM will be updated annually."

Please refer to 'Annexure-1: Revised Monitoring Plan' for further details on the changes in the monitoring plan of the Registered PDD.

Justification

The proposed revision request is in accordance with the guidance of "Procedures for Revising Monitoring Plans in accordance with Paragraph 57 of the Modalities and Procedures for the CDM/ Version 01" as outlined in Annex-34 of EB 26 Meeting Report. As per this guidance, for requesting revision of the registered monitoring plan, the project proponent and the verifying DOE are required to justify:

"The proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions".

The proposed revision of the registered monitoring plan entails fixing up the simple operating margin emission factor ($EF_{OM,y}$), the build margin emission factor ($EF_{BM,y}$) and hence the KPTCL grid emission factor (EF_y), calculated ex-ante at the time of project registration, for the entire crediting period. The ex-ante KPTCL grid emission factor is computed following the guidance of the Approved Consolidated Methodology ACM0002/ Version 02 based on publicly available information and conservative assumptions at the time of registration of the project activity. Computation of the same has been validated by the DOE (involved during validation) and formally accepted by the Executive Board of UNFCCC during the registration process.

The project proponent proposes the revisions of the registered monitoring plan due to the following reasons:

1. The annual up-dation of the KPTCL grid emission factor will require the project proponent to collate data from different sources available in the public domain (since complete set of data is not available from one source). In case certain data is not being made available in the public domain, the project proponent is required to compute the KPTCL grid emission factor based on certain assumptions. It is practically impossible for the project proponent to ensure consistency of data from different sources as well as reliability of those assumptions. However the ex-ante emission factor was computed based on power generation statistics made available by KPTCL (one source) on request. This ensured a higher level of consistency in the data used and consequently a higher accuracy of the ex-ante grid emission factor of KPTCL grid.

2. Furthermore, in accordance with the guidance of the Executive Board of UNFCCC which finally led to a revision of the Approved Consolidated Methodology-ACM0002 subsequent to the registration of the project activity, the project proponent could have considered the Southern Regional grid[1] emission factor (Regional Grid Emission Factor) instead of KPTCL

[1] Indian Power Grid is divided into five regional grids namely:

grid emission factor (State Grid Emission Factor) while determining the baseline emissions resulting from the project activity. This is justified since all the state grids in the Southern Region are connected and hydro power generated in the project activity will ultimately displace an equivalent power generation from KPTCL Grid which is a part of the Southern Regional Grid. The current emission factor of the Southern Regional Grid (as published by the Central Electricity Authority, Government of India and available at http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver2.pdf) is found to be higher than the KPTCL grid emission factor computed ex-ante in the Registered PDD. Therefore consideration of the ex-ante KPTCL grid emission factor for the entire crediting period of the project activity will lead to a conservative baseline emissions (and hence emission reduction) computations.

Therefore the proposed revision of the registered monitoring plan will not reduce the level of accuracy or completeness in the monitoring plan and verification process.

"The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity".

The proposed revision of the registered monitoring plan is in accordance with the guidance provided for computation of simple operating margin and build margin emission factor (and hence the grid emission factor) in the Approved Consolidated Methodology ACM0002/ Version 02. The methodology has provision for computation of the grid emission factor either 'ex-ante based on the most recent statistics available at the time of PDD submission' or 'ex-post for the year in which actual project generation and associate emission reductions occur'. The following text from the Approved Consolidated Methodology ACM0002/ Version 02 substantiate the same:

Guidance for computation of Simple Operating Margin Emission Factor:

"The Simple OM emission factor can be calculated using either of the two following data vintages for years(s) y:

- *A 3-year average, based on the most recent statistics available at the time of PDD submission,* or

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- Northern Regional Grid
- Eastern Regional Grid
- Southern Regional Grid
- Western Regional Grid and
- North Eastern Regional Grid

- *The year in which project generation occurs, if $EF_{OM,y}$ is updated based on ex post monitoring".*

and

Guidance for computation of Build Margin Emission Factor:

"Project participants shall choose between one of the following two options:

Option 1: Calculate the Build Margin emission factor $EF_{BM,y}$ ex ante based on the most recent information available on plants already built for sample group m at the time of PDD submission.

Option 2. For the first crediting period, the Build Margin emission factor $EF_{BM,y}$ must be updated annually ex post for the year in which actual project generation and associated emissions reductions occur".

The proposed revision of the registered monitoring plan entails computation of

- Simple OM Emission Factor ex-ante as 3-years average based on the most recent statistics available at the time of PDD submission and
- Build Margin Emission Factor ex-ante based on the most recent information available on plants already built for sample group m at the time of PDD submission

Therefore the proposed revision of the registered monitoring plan is in accordance with the approved monitoring methodology (*i.e.* ACM0002/ Version 02) applicable to the project activity under consideration.

"The findings of previous verification reports, if any, have been taken into account".

This needs to be justified by the verifying DOE.

Annexure-1: Revised Monitoring Plan

SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

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Title: Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources

Reference: Approved consolidated monitoring methodology ACM0002/Version 02

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

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>> KHEP project activity meets the applicability criteria of the 'Approved baseline methodology ACM0002'. (Please refer to Section B.2. for details). The applicability criteria of the 'Approved monitoring methodology ACM0002' are identical to those of the 'Approved baseline methodology ACM0002'. Therefore SKPCL has used the 'Approved monitoring methodology ACM0002' in conjugation with the 'Approved baseline methodology ACM0002' for the KHEP project activity.

The ACM0002 methodology requires the project participant to monitor power generation units exported to the grid. Since the KHEP project activity is a grid connected renewable energy project, emission reduction quantity is dependent on the net units exported to the grid, which will avoid generation of equivalent power by the carbon intensive KPTCL grid mix. Therefore the KHEP project activity's monitoring requirements are in line with the 'Approved monitoring methodology ACM0002',which is the most suitable monitoring methodology applicable for the KHEP project activity.

D.2. 1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario

Project emission associated to KHEP project activity is zero. Therefore this section is Not Applicable

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

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D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1. EG_y	Electricity supplied to the grid by the KHEP project activity	SKPCL records/ KPTCL records	MWh	Directly Measured	Hourly measurement and monthly recording	100%	Paper, During the crediting period and two years after	
2. EF_y	CO_2 emission factor of the grid	KPTCL/CEA	tCO_2/ MWh	Calculated	~~Yearly~~ Once at the start of the crediting period	100%	Electronic, During the crediting period and two years after	Calculated as weighted sum of OM and BM emission factors as per Step 3 of ACM0002

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
3. $EF_{OM,,y}$	CO_2 operating margin emission factor of the grid	KPTCL/CEA	t CO_2/ MWh	Calculated	~~Yearly~~ Once at the start of the crediting period	100%	Electronic, During the crediting period and two years after	Calculated as Step 1 of ACM0002
4. $EF_{BM,y}$	CO_2 build margin emission factor of the grid	KPTCL/CEA	t CO_2/ MWh	Calculated	~~Yearly~~ Once at the start of the crediting period	100%	Electronic During the crediting period and two years after	Calculated as Step 2 of ACM0002

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
5. $F_{i,j,y}$	Amount of fossil fuel i, consumed by each power source/ plant in year y	KPTCL/CEA	tons	Calculated	~~Yearly~~ Once at the start of the crediting period	100%	Electronic During the crediting period and two years after	Calculated based on the Total power generation, Average Net Calorific Value of the Fuel used and the Designed Station Heat Rate data of power plants of KPTCL grid

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
6. $COEF_{i,}$	CO_2 emission factor of each fuel type i,	IPCC/local	t CO_2 / ton of fuel	Standard /Calculated	~~Yearly~~ Once at the start of the crediting period	100%	Electronic, During the crediting period and two years after	Calculated based on the IPCC default value of the Emission Factor, Net Calorific Value and Oxidation Factor of the Fuel used by the power plants of KPTCL grid
7. $GEN_{j,y}$	Electricity delivered to the grid by power source j in year y	KPTCL/CEA	MWh/ annum	Measured	~~Yearly~~ Once at the start of the crediting period	100%	Electronic, During the crediting period and two years after	Obtained from authentic and latest local statistics.

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
8.	Plant Name	Power Source/plant 'j' of KPTCL for the OM	Text	estimated	~~Yearly~~ Once at the start of the crediting period	100% of set of plants	Electronic, During the crediting period and two years after	
9.	Plant Name	Power Source/plant of KPTCL for the BM	Text	estimated	~~Yearly~~ Once at the start of the crediting period	100% of set of plants	Electronic, During the crediting period and two years after	

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
10.$GEN_{j/k/l,yIMPORTS}$	Electricity quantity	Electricity imports to KPTCL	kWh	Measured	~~Yearly~~ Once at the start of the crediting period	100%	Electronic, During the crediting period and two years after	Obtained from authentic and latest local statistics.
11.$COEF_{i,j,yIMPORTS}$	Emission factor coefficient	MNES/Other Government data sources	t CO_2 / kWh	Standard /Calculated	~~Yearly~~ Once at the start of the crediting period	100%	Electronic, During the crediting period and two years after	

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

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>>With reference to ACM0002, baseline emissions are estimated as under

Calculation of electricity baseline emission factor

An electricity baseline emission factor (EF_y) is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors according to the following three steps. Calculations for this combined margin must be based on data from an official source (where available) and made publicly available.

STEP 1. Calculate the Operating Margin emission factor(s)

Out of four methods mentioned in the ACM0002, Simple OM approach has been chosen for calculations since in the KPTCL grid mix, the low-cost/must run resources constitutes less than 50% of total grid generation. Simple OM factor is calculated as under.

$EF_{OM,simple,y}$ is calculated as the average of the most recent three years (2001-2002, 2002-2003 & 2003-2004) at the start of the crediting period *i.e.* at the time of PDD submission.

$$EF_{OM,simple,y} = \frac{\sum_{i,j} F_{i,j,y} \, x \, COEF_{i,j}}{\sum_{j} GEN_{j,y}}$$

where

$COEF_{i,j\,y}$ - Is the CO_2 emission coefficient of fuel i (t CO_2 / mass or volume unit of the fuel), calculated as given below and

$GEN_{j,y}$ - Is the electricity (MWh) delivered to the grid by source j

$F_{i,j,y}$ - Is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in year(s) y , calculated as given below

j -Refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants, and including imports from the grid

The Fuel Consumption $F_{i,j,y}$ is obtained as

$$\sum_i F_{i,j,y} = \left(\sum_j GEN_{j,y} \otimes 860 \Big/ NCV_i \otimes E_{i,j} \right)$$

where

$GEN_{j,y}$ - Is the electricity (MWh) delivered to the grid by source j

NCV_i - Is the net calorific value (energy content) per mass or volume unit of a fuel i

$E_{i,j}$ - Is the efficiency (%) of the power plants by source j

The CO_2 emission coefficient $COEF_i$ is obtained as

$$COEF_i = NCV_i \otimes EF_{CO2,i} \otimes OXID_i$$

where

NCV_i Is the net calorific value (energy content) per mass or volume unit of a fuel i

$EF_{CO2,i}$ Is the CO_2 emission factor per unit of energy of the fuel i

$OXID_i$ Is the oxidation factor of the fuel

STEP 2. Calculate the Build Margin emission factor ($EF_{BM,y}$) as the generation-weighted average emission factor (t CO_2/MWh) of a sample of power plants m of KPTCL grid, as follows:

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \, x \, COEF_{i,m}}{\sum_{m} GEN_{m,y}}$$

where

$F_{i,m,y}$, $COEF_{i,m}$ and $GEN_{m,y}$ - Are analogous to the variables described for the simple OM method above for plants m.

Considered calculations for the Build Margin emission factor $EF_{BM,y}$ ~~which is updated annually ex-post for the year in which actual project generation and associated emissions reductions occur~~ is performed ex-ante based on the most recent (2003-2004) information available on plants already built for sample group m at the time of PDD submission. The sample group m for the most recent year consists of the 20 (twenty) power plants that have been built most recently, since it comprises of larger annual power generation. (Refer to Table 3-5 of Annex 3)

Further, power plant capacity additions registered as CDM project activities have been excluded from the sample group m of KPTCL grid mix.

STEP 3. Calculate the electricity baseline emission factor $EF_{electricity,y}$ as the weighted average of the Operating Margin emission factor ($EF_{OM,y}$) and the Build Margin emission factor ($EF_{BM,y}$):

$$EF_y = W_{OM} \otimes EF_{OM,y} \oplus W_{BM} \otimes EF_{BM,y}$$

where the weights w_{OM} and w_{BM}, by default, are 50% (i.e., $w_{OM} = w_{BM} = 0.5$), and $EF_{OM,Simple,y}$ and $EF_{BM,y}$ are calculated as described in Steps 1 and 2 above and are expressed in t CO_2/MWh.

$$BE_y = EF_y \, x \, EG_y$$

where

BE_y - Are the baseline emissions due to displacement of electricity during the year y in tons of CO_2

EG_y - Is the electricity supplied to the grid by the KHEP project activity during the year y in MWh, and

EF_y - Is the CO_2 baseline emission factor for the electricity displaced due to the project activity in during the year y in tons CO_2/MWh.

For this methodology, it is assumed that transmission and distribution losses in the electricity grid are not influenced significantly by the project activity. They are therefore neglected.

D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

Not Applicable

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:								
ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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D.2.3. Treatment of leakage in the monitoring plan

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

There are no emission sources as leakage in the KHEP project activity. Further, the methodology ACM0002 too requires the project participants not to consider emission sources as leakage. Therefore this section is Not Applicable

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

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Formula used for estimation of the total net emission reductions due to the KHEP project activity during a given year *y* is as under.

$$ER_y = BE_y - PE_y - L_y$$

where

ER_y - Are the emissions reductions of the project activity during the year y in tons of CO_2

BE_y - Are the baseline emissions due to displacement of electricity during the year y in tons of CO_2

PE_y - Are the project emissions associated with KHEP

L_y - Are the emissions sources as leakage

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored		
Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
Baseline Emissions		
1. EG_y - Electricity supplied to the grid by the KHEP project activity	Low	Electricity meters are properly maintained with regular testing and calibration schedules developed as per the technical specification requirements to ensure accuracy.
1. EF_y - CO_2 emission factor of the grid	Low	This is calculated based on the parameters 3. EFOM,y and 4. EFBM,y.
3. $EF_{OM,y}$ - CO_2 operating margin emission factor of the grid	Low	This is calculated based on the parameters 5. Fi,j,y , 6. COEFi,j,y and 7. GENj,y..
4. $EF_{BM,y}$ - CO_2 build margin emission factor of the grid	Low	This is calculated based on the parameters 5. Fi,m,y , 6. COEFi,m,,y and 7. GENm,,y..
5. $F_{i,j,y}$ / $F_{i,m,y}$ - Amount of fossil fuel i, consumed by each power source/ plant in year y	Low	This is calculated based on the parameters 2. NCVi, 6. Ei,j/Ei,m and 7. GENm,,y..
6. $COEF_{i,j,y}$ / $COEF_{i,m,y}$ - CO2 emission factor of each fuel type i,	Low	Please refer to point 3.
7. $GEN_{j,y}$ / $GEN_{m,y}$ - Electricity delivered to the grid by power source j/m in year y	Low	This is based on authentic grid data.
8. Plant name - Power Source/plant 'j' of KPTCL for the OM	Low	This is based on authentic grid data.
9. Plant name - Power Source/plant of KPTCL for the BM	Low	This is based on authentic grid data.
10.$GEN_{j/k/l,yIMPORTS}$ - Electricity imports to KPTCL	Low	This is based on authentic grid data.
11.$COEF_{i,j,yIMPORTS}$ - Emission factor coefficient for imports	Low	This is based on authentic government data.

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

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SKPCL has implemented an operational and management structure in order to monitor emission reductions and any leakage effects, generated by the KHEP project activity.

SKPCL has formed a CDM team/committee comprising of persons from relevant departments, which will be responsible for monitoring of all the parameters mentioned in this section. The CDM team also comprises of a special group of operators who are assigned the responsibility of monitoring of different parameters and record keeping as per the monitoring plan (ref. Annex 4). On a weekly basis, the monitoring reports are checked and discussed by the seniors CDM team members/managers. In case of any irregularity observed by any of the CDM team member, it is informed to the concerned person for necessary actions. On monthly basis, these reports are forwarded at the management level.

D.5 Name of person/entity determining the monitoring methodology:

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>> SKPCL along with guidance from the project consultants.

Annex 4

MONITORING PLAN

The aim is to enable KHEP project activity to have a clear, credible, and accurate set of monitoring, evaluation and verification procedures. The purpose of these procedures would be to direct and support continuous monitoring of project performance/key project indicators to determine project outcomes, greenhouse gas (GHG) emission reductions.

The project activity's revenue is based on the units exported as measured by power meters at plant and check meters at the high-tension substation of the KPTCL. The monitoring and verification system mainly comprise of these meters as far as power export is concerned. The export of electricity will be through invoices to KPTCL. The invoices, based on meter readings will also be covered in the regular finance audit.

The KHEP project activity has employed the latest state of art monitoring and control equipment that measure, record, report, monitor and control various key parameters. Parameters monitored are the total power generated, power exported to the grid and auxiliary power generated. These monitoring and controls will be the part of the Distributed Control System (DCS) of the entire plant.

The instrumentation system of the KHEP project activity comprises of microprocessor-based instruments of reputed make with desired level of accuracy. All instruments will be calibrated and marked at regular intervals so that the accuracy of measurement can be ensured all the time.

The quantity of emission reduction units claimed by the project activity is only a fraction of the total generated emissions, which depends on the actual generation mix of the grid ~~in a particular year~~. KPTCL ~~publishes yearly~~ reports regarding the performance of all power generation units have been used to determine the ex-ante emission factor of KPTCL grid. Hence, authentic data related to the measurements, recording, monitoring and control of the generation mix of the KPTCL network is ensured.

The KPTCL report contains all information regarding type of generation like hydro, thermal, nuclear, renewable *etc*., installed capacity, de-rated capacity, performance of generating unit, actual generation, capacity additions ~~during the year~~, *etc*. for the most recent three years (2001-2002, 2002-2003 & 2003-2004) at the time of PDD submission which ~~can be used for verification of generation mix and~~ is used to determine the ex-ante emission factor~~s~~ for baseline calculation ~~for a particular year~~.

Project Parameters affecting Emission Reduction

Monitoring Approach

The general monitoring principles are based on:

- Frequency
- Reliability
- Registration and reporting

As the emission reduction units from the project are determined by the number of units exported to the grid (and then multiplying with appropriate emission factor) it becomes important for the project to monitor the net export of power to the grid on real time basis.

Frequency of monitoring

The KHEP has installed all metering and check metering facilities within the plant premises as well as in the grid substation where exported power is connected to the grid. The measurement is recorded and monitored on a continuous basis by both KPTCL and SKPCL through DCS.

Reliability

The amount of emission reduction units is proportional to the net energy generation from the project. Thus the final kWh meter reading is the final value from project side. All measurement devices will be of microprocessor based with best accuracy and will be procured from reputed manufacturers. Since the reliability of the monitoring system is governed by the accuracy of the measurement system and the quality of the equipment to produce the result all power measuring instruments must be calibrated once a year for ensuring reliability of the system. All instruments carry tag plates, which indicate the date of calibration and the date of next calibration. Therefore the system ensures the final generation is highly reliable.

Registration and reporting

Registration of data is on-line in the control cabin through a microprocessor. However, hourly data logging will be there in addition to software memory. Daily, weekly and monthly reports are prepared stating the generation. In addition to the records maintained by the SKPCL, KPTCL also monitors the power exported to the grid and certify the same.

No other project specific indicators are identified that affect the emission reductions claims.