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# Verification Report

**International Power Corporation Limited**

**2<sup>nd</sup> Periodic Verification**

**Of the**

**“18 MW Kemphole Mini Hydrel Scheme (KMHS), by  
International Power Corporation Limited, India”**

**UNFCCC 0312-CDMP**

Report No. 1001741, Version **1.2**

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**TÜV Industrie Service GmbH TÜV SÜD Group  
Carbon Management Service  
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<b>Report Title:</b>		2 <sup>nd</sup> Periodic Verification of the "18 MW Kemphole Mini Hydel Scheme by International Power Corporation Limited, India"		
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<b>Summary:</b>				
<p>TÜV SÜD Industrie Service GmbH TÜV SÜD Group has performed a verification of the CDM project: "18 MW Kemphole Mini Hydel Scheme by International Power Corporation Limited, India". The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".</p> <p>The management of International Power Corporation Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the "18 MW Kemphole Mini Hydel Scheme by International Power Corporation Limited, India" project on the basis set out within the project's revised monitoring plan which was approved by CDM EB. The revised monitoring plan is as per approved methodology ACM002, version 4. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.</p> <p>The verifier confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project generates GHG emission reductions.</p> <p>The verifier can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:</p> <p><u>Reporting period:</u> From 01-05-2006 to 30-04-2007</p> <p><u>Verified emissions in the above reporting period:</u></p> <p>Baseline emissions: 44,522 44,477 t CO<sub>2</sub> equivalents                      Project emissions: 0 t CO<sub>2</sub> equivalents                      Emission reductions: 44,522 44,477 t CO<sub>2</sub> equivalents</p>				
<b>Work carried out by:</b>			<b>Internal Quality Control by:</b>	
<ul style="list-style-type: none"> <li>Abhishek Goyal ( Assessment Team Leader (ATL), GHG Auditor)</li> <li>Sunil Kathuria (GHG Auditor, Lead Auditor Environmental Management Systems (ISO 14001), Local Expert)</li> <li>Bratin Roy (Assessment Team Leader (ATL), GHG Auditor, Lead Auditor Environmental Management Systems (ISO 14001), Local Expert)</li> </ul>			<ul style="list-style-type: none"> <li>Javier Castro (Deputy Head of Certification Body)</li> </ul>	



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## Abbreviations

<b>CAR</b>	Corrective Action Request
<b>CDM</b>	Clean Development Mechanism
<b>CER</b>	Certified Emission Reduction
<b>CR</b>	Clarification Request
<b>DNA</b>	Designated National Authority
<b>DOE</b>	Designated Operational Entity
<b>EB</b>	Executive Board
<b>ER</b>	Emission reduction
<b>FAR</b>	Forward Action Request
<b>GHG</b>	Greenhouse gas(es)
<b>JI</b>	Joint Implementation
<b>IPCL</b>	International Power Corporation Limited
<b>KP</b>	Kyoto Protocol
<b>MP</b>	Monitoring Plan
<b>MW</b>	Megawatts
<b>NGO</b>	Non Governmental Organization
<b>PDD</b>	Project Design Document
<b>SEB</b>	State Electricity Board
<b>TÜV SÜD</b>	TÜV SÜD Industrie Service GmbH TÜV SÜD Group
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VVM</b>	Validation and Verification Manual



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Annex 1: Verification Protocol

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## 1 INTRODUCTION

### 1.1 Objective

International Power Corporation Limited has commissioned an independent verification by TÜV SÜD Industrie Service GmbH (TÜV SÜD) of its CDM project: "18 MW Kemphole Mini Hydel Scheme by International Power Corporation Limited, India". Verification is the periodic independent review and ex post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions during the defined verification period.

In general the objective of verification can be divided in Initial Verification and Periodic Verification:

- § **Initial Verification:** The objective of an initial verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project will generate verifiable emission reductions. A separate initial verification prior to the project entering into regular operations is not a mandatory requirement.
- § **Periodic Verification:** The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; further more the periodic verification evaluates the GHG emission reduction data and express a conclusion whether the reported GHG emission reduction data is "free" of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. If no prior initial verification has been carried out, the objective of the first periodic verification also includes the objectives of the initial verification.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring reports submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification follows UNFCCC criteria; refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

As the project has already been initially verified in July 2006 (Verification Report No. 831253 Version 01), the assessment presented herewith only covers the tasks to be performed in the periodic verification as described above.

### 1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions. The verification is based on validated project design document including baseline. These documents are reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of CERs.



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The verification is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

The audit team has been provided with a Monitoring Report in May 2007, covering the period May 1, 2006 – April 30, 2007, which has been made publicly available on the UNFCCC website (see: <http://cdm.unfccc.int/Issuance/MonitoringReports> ). Based on this documentation, a document review and a fact finding mission in form of an on-site audit has taken place. Afterwards the client decided to revise the Monitoring Report according to the CAR and CR indicated in the audit process. The final Monitoring Report version submitted in June 2008 serves as the basis for the assessment presented herewith.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the audit team performing the verification have to cover at least the following aspects:

- Ø Knowledge of Kyoto Protocol and the Marrakech Accords
- Ø Environmental and Social Impact Assessment
- Ø Skills in environmental auditing (ISO 14000, EMAS)
- Ø Quality assurance
- Ø Technical aspects of power generation out of hydro plants
- Ø Monitoring concepts
- Ø Political, economical and technical random conditions in host country

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body "climate and energy":

**Abhishek Goyal** is an Assessment Team Leader for CDM/JI projects and environment/energy expert at TÜV SÜD Industrie Service GmbH. Before joining the TÜV SÜD Industrie Service GmbH he has worked on development of PDDs and methodologies for several energy efficiency, renewable energy, and waste to energy projects. He has extensive experience in CDM.

**Sunil Kathuria** was part of the audit team but left the organization in last quarter of 2007. He was a GHG Auditor for CDM/JI projects and lead auditor for quality and environmental management systems (according to ISO 9001 and ISO 14001) at TÜV SÜD South Asia Pvt. Ltd. He was based in New Delhi. In his position he was implementing validation, verification and certifications audits for management systems. He has received extensive training in the CDM validation process and participated already in several CDM project assessments.

**Bratin Roy** is an Assessment Team Leader for CDM/JI projects at TÜV SÜD South Asia, TÜV SÜD Group and lead auditor for quality, environment and occupational health and safety management system (according to ISO 9001, ISO 14001 and OHSAS 18001). He holds a master degree in environmental science. He is based in Pune, India. He has received extensive training in the CDM validation and verification processes.

The audit team covers the above mentioned requirements as follows:

- Ø Knowledge of Kyoto Protocol and the Marrakech Accords (All)
- Ø Environmental and Social Impact Assessment (All)
- Ø Skills in environmental auditing (All)
- Ø Quality assurance (All)
- Ø Technical aspects of hydro plants (All)
- Ø Monitoring concepts (All)
- Ø Political, economical and technical random conditions in host country (All)



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In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body "climate and energy":

- Ø Javier Castro (Deputy head of the certification body "climate and energy")

### **1.3 GHG Project Description**

The project involves the implementation of a run-of-river hydro project on the Kempthole stream. The installed capacity of the plant is 18 MW<sub>el</sub>. The electricity generated is sold primarily to the state grid.

Project participant is International Power Corporation Limited, India.

The project starting date is October 20, 2003, and also the first renewable crediting period of 7 years started on October 20, 2003.

The first monitoring period (20-10-2003 to 30-04-2006) of this project activity has already been verified in the first periodic verification (see Verification Report No. 831253, Version 01). This periodic verification covers the second monitoring period which directly follows the first one. There is no change in the project since initial verification.



## 2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual, an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a verification protocol was customized for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM/JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been proved and the result of the verification.

The verification protocol consists of four tables. The different columns in these tables are described in Figure 1.

The completed protocol is enclosed in Annex 1 to this report.

Periodic Verification Checklist		
Table 1: Data Management System/Controls		
Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	<p>A score is assigned as follows:</p> <p><b>Full</b> all best-practice expectations are implemented.</p> <p><b>Partial</b> a proportion of the best practice expectations is implemented</p> <p><b>Limited</b> this should be given if little or none of the system component is in place.</p>	<p><i>Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications</i></p>

Periodic Verification Checklist		
Table 2: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks





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Periodic Verification Checklist		
Table 2: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Identification of potential reporting risks based on an assessment of the emission estimation procedures.</p> <p>Identification of key source data. Focus on those risks that impact the accuracy, completeness and consistency of the reported data.</p>	<p>Identification of the key controls for each area with potential reporting risks. Assessment of adequacy of the key controls and eventually test that the key controls are actually in operation.</p> <p>Internal controls include, Understanding of responsibilities and roles, Reporting, reviewing and formal management approval of data; Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc.</p>	<p><i>Identification of areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks</i></p> <p><i>Areas where data accuracy, completeness and consistency could be improved are highlighted.</i></p>

Periodic Verification Checklist		
Table 3: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including FARs)
<p><i>List of residual areas of risks of Periodic Verification Checklist Table 2 where detailed audit testing is necessary.</i></p> <p><i>In addition, other material areas may be selected for detailed audit testing.</i></p>	<p><i>The additional verification testing performed is described. Testing may include:</i></p> <ul style="list-style-type: none"> <li>§ <i>Sample cross checking of manual transfers of data</i></li> <li>§ <i>Recalculation</i></li> <li>§ <i>Spreadsheet 'walk throughs' to check links and equations</i></li> <li>§ <i>Inspection of calibration and maintenance records for key equipment</i></li> <li>§ <i>Check sampling analysis results</i></li> </ul> <p><i>Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.</i></p>	<p><i>Having investigated the residual risks, the conclusions are noted here. Errors and uncertainties are highlighted.</i></p>

Figure 1 Verification Protocol Tables

## 2.1 Review of Documents

The monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached as Annex 2 to this report.

## 2.2 Follow-up Interviews

On May 26, 2007 TÜV SÜD performed interviews with project stakeholders to confirm selected information. Representatives of International Power Corporation Limited were interviewed. The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
International Power Corporation Limited	<ul style="list-style-type: none"> <li>Ø Changes to project design and implementation since last verification</li> <li>Ø Technical equipment and operation</li> <li>Ø Monitoring plan</li> <li>Ø Monitored data</li> <li>Ø Data uncertainty and residual risks</li> <li>Ø GHG calculation</li> <li>Ø Environmental impacts</li> <li>Ø Compliance with national laws and regulations</li> </ul>

## 2.3 Resolution of Corrective and Forward Action Requests

The objective of this phase of the verification was to resolve the requests for corrective actions and any other outstanding issues which needed to be clarified for TÜV SÜD's positive conclusion on the GHG emission reduction calculation. The Corrective Action Requests and clarification request, raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. Forward Action Requests are indicated issues which do not effect the generation of emission reduction in the verified period, but shall be improved in order to ensure the reliability of future data. To guarantee the transparency of the verification process, the concerns raised and responses that have been given are summarized in chapter 3 below and documented in more detail in the verification protocol in Annex 1.



### 3 VERIFICATION FINDINGS

In the following sections the findings of the verification are stated. The verification findings for each verification subject are presented as follows:

The findings from the desk review of the final monitoring report and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in Annex 1.

- 1) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Annex 1. The second periodic verification of the project resulted in Corrective Action Requests and Clarification Request.
- 2) Where Corrective Action Requests have been issued, the exchanges between the Client and TÜV SÜD to resolve these Corrective Action Requests are summarized.
- 3) In the context of Forward Action Requests, risks have been identified, which may endanger the delivery of high quality CERs in the future, i.e. by deviations from standard procedures as defined by the MP. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions. Forward Action Requests are understood as recommendation for future project monitoring; they are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Annex 1.
- 4) The final conclusions for verification subject are presented.

The verification findings relate to the project implementation as documented and described in the final monitoring report.

## **Second Periodic Verification Findings**

### **3.1 Remaining issues, CARs, FARs from the previous verification**

There were no remaining issues or FARs in the previous verification.

### **3.2 Completeness of Monitoring**

#### **3.2.1 Discussion**

The reporting procedures reflect the monitoring plan content. Electrical energy exported and imported by project activity is measured continuously using bi-directional energy meters installed on Line 1 and Line 2. The electricity exported and imported is sum of measurement at Line 1 and Line 2. Each line has two meters, one main meter and other check meter. The meters are installed at switchyard within the plant premises and are sealed by Grid Company (Karnataka Power Transmission Corporation Ltd.). Monthly joint meter readings from main meters are used for emission reduction calculation and invoicing to Grid Company. In event of failure of main meter, readings from check meters are used. Energy exported and imported is also recorded in log sheets at project site by International Power Corporation Limited (IPCL) for each line separately.

Export and import readings are jointly recorded by project proponent (IPCL) and Grid Company in the monthly joint metering report and net electrical energy content exported to the grid is invoiced. Joint meter reading for each month forms the basis for calculation of emission reductions by the project activity. This parameter is most significant to determine the emission reductions from the project activity.

Gross electricity generation and auxiliary consumption are also measured continuously using energy meters and recorded hourly in log sheets at project site. These parameters are not mentioned in monitoring plan of the registered PDD and hence are not reported in the monitoring report.

The grid emission factor has been used as a predetermined default value, which has been defined in the registered PDD and confirmed during validation of the project. However, based on review of the registered PDD, it is difficult to understand whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification process. Corrective action request was raised on this issue. Following this request, revised monitoring plan was submitted to CDM EB for its approval. Revised monitoring plan has been approved by CDM EB and it is clear that ex-ante grid emission factor should be used for calculation of emission reductions.

#### **3.2.2 Findings**

##### **Corrective Action Request No.1.**

As stipulated in the PDD, monitoring report should include information on number of people employed directly in the project activity.

##### **Response by project proponent:**

The information has been provided in the revised monitoring report.

### Corrective Action Request No.2.

Based on review of the registered PDD, audit team is of the opinion that monitoring plan in the registered PDD is not consistent within itself and with other sections of the PDD. It is difficult to understand whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification process. To remove the inconsistencies, revised monitoring plan should be submitted to CDM EB.

#### Response by project proponent:

Revised monitoring plan has been submitted to CDM EB.

#### Final response by audit team:

Revised monitoring plan has been approved by CDM EB (<http://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view>). It is clear that ex-ante grid emission factor should be used for calculation of emission reductions during the verification process.

### **3.2.3 Conclusion**

Information on number of people directly employed in the project activity has been provided in the monitoring report and is deemed appropriate. The project complies with the requirements.

## **3.3 Accuracy of Emission Reduction Calculations**

### **3.3.1 Discussion**

The calculation procedures reflect the monitoring plan content. Export and import readings are jointly recorded by project proponent (IPCL) and grid company (KPTCL) in the monthly joint metering report and net electrical energy content exported to the grid is invoiced. Joint meter reading for each month forms the basis for calculation of emission reductions by the project activity. This parameter is most significant to determine the emission reductions from the project activity.

The main and check meters on line 2 were found to be within the acceptable limits of error as per calibration test conducted on 6 January 2007. However, the main and check meters on line 1 were found to be outside the acceptable limits of error as per calibration test conducted on 29 December 2006. Clarification was requested by audit team as to how the error has been considered in emission reduction calculations. The issue has been clarified and justification is as follows:

The calibration tests were done on main and check meters at Line 1 on 29 December 2006 for active power in export mode at Unity Power Factor (UPF), 0.86 lag and 0.5 lag for 100%, 50% and 10% load. The maximum positive error observed during calibration test of main meter was 0.645% at Unity Power Factor (UPF) with 100% load. Same has been conservatively applied for exported amount of electricity measured by main meter from May 2006 to March 2007. The minimum negative error was -0.153 at UPF with 10% load.

The error in import mode was within acceptable limits. It must be noted that the main meter was measuring energy without errors from May 2006-November 2006 since the difference between the main and check meter readings during this period was very small in the range of 0.04 to 0.09%. The error occurred in main and check meter readings only during December 2006 which was evident by difference between readings of two meters. Even after the error was observed, the buyer, KPTCL was purchasing electricity based on erroneous main meter reading up to March 2007. The main meter has been sent for re-calibration on 3 April 2007. For month of April the electricity has been purchased by KPTCL based on erroneous check meter reading. Hence



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it is very conservative to apply the maximum observed positive error to measured amount of electricity exported through Line 1 for period during May 2006 to March 2007. The maximum positive error observed during calibration test of check meter was 2.226% at 0.86lag with 100% load. Same has been conservatively applied for exported amount of electricity measured by check meter for April 2007. The minimum negative error was -5.823 at UPF with 50% load.

### 3.3.2 Findings

#### Clarification Request No. 1.

Please explain why there is no import from the KPTCL grid during July-06 to October 06, and make the same transparent in the Monitoring Report. In addition please include a statement quantifying planned and forced outages in the Monitoring Report.

#### Response by project proponent:

During the period July-06 to October 06 the generation was taking place without interruption. Hence no import was made from KPTCL. A statement quantifying planned and forced outages is included in the revised Monitoring Report.

#### Corrective Action Request No.3.

The monitoring report must state all the changes in meters carried out during the monitoring period with the reasons for such changes. In addition multiplication factor for each meter is to be included in the monitoring report.

#### Response by project proponent:

There was an error in the readings of the tri-vector meter connected to Line 1. The readings were slightly higher than the permissible limits. The meter was released on 3<sup>rd</sup> April 2007 and sent to Manufacturer viz. Larson and Tubro Ltd. for rectification. The situation has been stated in the monitoring report.

Multiplication factor has now been included in the Monitoring report.

#### Response by audit team

The main and check meters on line 2 were found to be within the acceptable limits of error as per calibration test conducted on 6 January 2007. However, the main and check meters on line 1 were found to be outside the acceptable limits of error as per calibration test conducted on 29 December 2006. Please clarify how the error has been considered in emission reduction calculations.

It is not clear why the main meter that was found to be erroneous on 29 December 2006 was sent for rectification on 3 April 2007. Please clarify why the readings from main meter have been used for emission reduction calculations and invoicing during this period.

#### Response by project proponent:

The meters used for energy metering at the project site are under the custody of KPTCL and the agency is responsible for testing and calibration of these meters. PP does not have any control on the meters testing/ calibration.

During the testing of meters on 29th December 2006, the main meter in Line 1 was found to be working outside the permissible limit and KPTCL released the meter on 3rd April 2007, which in turn was sent to the manufacturer M/s Larson and Tubro Ltd. for rectification.



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During the tests of the meters on 29th December 2006, a maximum error of 0.6454127% was found in the Main meter and 2.2266469% in the Check meter.

During the period i.e. upto March 2007, KPTCL continued with the same Main meter for billing purpose. From the month of April 2007, however KPTCL took the readings of Check meter as the basis for net electrical energy export in Line 1.

However, for conservative estimation of emission reductions from the project activity during the period from May 2006 – April 2007, net electrical energy export readings have been adjusted to accommodate the maximum errors in the meters. The errors have been discounted for the entire period under monitoring i.e. May 2006 – April 2007. This is most conservative.

For the period between May2006 – Mar2007, an error of 0.6454127% (maximum error observed in the Main meter) and for the month of April 2007, an error of 2.2266469% (maximum error observed in Check meter) has been adjusted from the recorded net electrical energy export. This is most conservative.

The difference between emission reductions with and without error consideration is about 143 CERs. Hence the revised emission reductions from the project activity for the monitored period is now 44522 (earlier figure 44665).

#### Final response by audit team

The calibration tests were done on main and check meters at Line 1 on 29 December 2006 for active power in export mode at Unity Power Factor (UPF), 0.86 lag and 0.5 lag for 100%, 50% and 10% load. The maximum positive error observed during calibration test of main meter was 0.645% at Unity Power Factor (UPF) with 100% load. Same has been conservatively applied for exported amount of electricity measured by main meter from May 2006 to March 2007. The minimum negative error was -0.153 at UPF with 10% load.

The error in import mode was within acceptable limits. It must be noted that the main meter was measuring energy without errors from May2006-November 2006 since the difference between the main and check meter readings during this period was very small in the range of 0.04 to 0.09%. The error occurred in main and check meter readings only during December 2006 which was evident by difference between readings of two meters. Even after the error was observed, the buyer, KPTCL was purchasing electricity based on erroneous main meter reading up to March 2007. The main meter has been sent for re-calibration on 3 April 2007. For month of April the electricity has been purchased by KPTCL based on erroneous check meter reading. Hence it is very conservative to apply the maximum observed positive error to measured amount of electricity exported through Line 1 for period during May 2006 to March 2007. The maximum positive error observed during calibration test of check meter was 2.226% at 0.86 lag with 100% load. Same has been conservatively applied for exported amount of electricity measured by check meter for April 2007. The minimum negative error was -5.823 at UPF with 50% load.

### **3.3.3 Conclusion**

The project complies with the requirements.

## **3.4 Quality of Evidence to Determine Emission Reductions**

### **3.4.1 Discussion**

The critical parameters for the determination of GHG emissions are the amount of electricity exported and imported which are measured by calibrated meters. The responsibility of calibration



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for the main meters and check meters on both lines lies with KPTCL. Calibration test has been done once during the one year monitoring period under consideration. Meters on line 1 have been tested on 29 December 2006 and that on line 2 have been tested on 6 January 2007. However, please see CAR 3 above.

The audit team did verify the following parameters:

- Energy export and import for line 1 and line 2 separately through joint meter recording sheets for each month
- Invoices raised for the months
- Account documents for the payments received
- Energy export and import for line 1 and line 2 measured and recorded in plant log sheets
- Gross energy generation and auxiliary energy consumption for each unit measured at plant and recorded in log sheets.

All data is in compliance with the figures stated in the monitoring report.

### 3.4.2 Findings

#### Corrective Action Request No.4.

The accuracy % of the meter defined in the Monitoring report is not correct. It is mentioned of 0.1% whereas actual meters are of 0.2%.

#### Response by project proponent:

The accuracy level has been corrected as 0.20% in the revised monitoring report.

#### Corrective Action Request No.5.

The meters with 0.2% accuracy level on Line 2 were not recalibrated until 6 January 2007, which is more than one year after previous calibrations conducted on 10 September 2005. Please clarify as to how the energy export and import from Line 2 can be considered appropriate for the monitoring period.

#### Response by project proponent:

An error of 0.1941862% in export mode (maximum error observed in the export mode of main meter) and an error of 0.1863014% in import mode (maximum error observed in the import mode of the main meter) have been observed during testing of meter which was well within the permissible error margin. However there was a time lag of four months from the required date of calibration, so for conservative estimations, an error of 0.2% (maximum permissible error) has been adjusted from the recorded net electrical energy export/ import to/ from the grid. This is the most conservative.

#### Final response by audit team

A correction based on the maximum inaccuracy specification of the meters i.e. ( $\pm$ ) 0.2% for export and import energy units has been applied. The total energy export for the monitoring period has been reduced by 0.2% whereas the total energy import has been increased by 0.2%. Same calculation is also transparently defined in the revised monitoring report. This is considered conservative approach by audit team.





Industrie Service

### **3.4.3 Conclusion**

The project complies with the requirements.

## **3.5 Management System and Quality Assurance**

### **3.5.1 Discussion**

No CDM specific internal audits are required as such because the monitoring and measurement of power exports and imports are done diligently every month as core business of the company and hence a permanent control of the figures in joint meter readings as well as invoices raised takes place. However company has a system of internal audit and reviews of findings at six months intervals. Last such audits were carried out in May 2006 and November 2006.

Quality assurance procedures are in place, for example the joint meter reports and respective billings are reviewed for accuracy and correctness by a staff member before submission. Staff was made aware of the quality assurance procedure.

All the data is transferred to the Head Office at Bangalore, India, on a monthly basis and kept protected. The IT system is based on standard PC and MS-office solutions. Hence the verification team feels confident about its use.

### **3.5.2 Findings**

None

### **3.5.3 Conclusion**

The project complies with the requirements.



## 4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Emission Reductions	
<b>Completeness</b>	Source coverage/ boundary definition	ü	ü	ü	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently. CAR 1 resolved.
<b>Accuracy</b>	Physical Measurement and Analysis	ü	ü	ü	The Data is accurately measured and presented in transparent manner. CAR 3 and CAR 4 are resolved.
	Data calculations	ü	ü	ü	The data calculations are accurate. CR 1, CAR 2, CAR 3 are resolved.
	Data management & reporting	ü	ü	ü	A data management system is in place.
<b>Consistency</b>	Changes in the project	-	-	-	There are no changes in the project to date.

## 5 VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH TÜV SÜD Group has performed a verification of the CDM project: "18 MW Kemphole Mini Hydel Scheme by International Power Corporation Limited, India". The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marra-kech Accords".

The management of International Power Corporation Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the "18 MW Kemphole Mini Hydel Scheme by International Power Corporation Limited, India" project on the basis set out within the project's revised monitoring plan which was approved by CDM EB. The revised monitoring plan is as per approved methodology ACM0002, version 4. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.

The verifier confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project generates GHG emission reductions.

The verifier can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Reporting period: From 01-05-2006 to 30-04-2007

Verified emissions in the above reporting period:

Baseline emissions: ~~44,522~~ 44,477 t CO2 equivalents

Project emissions: 0 t CO2 equivalents

Emission reductions: ~~44,522~~ 44,477 t CO2 equivalents

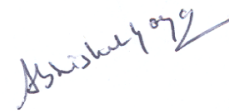
Munich, ~~25-06-2008~~ 08-08-2008

Munich, ~~25-06-2008~~ 08-08-2008



Javier Castro


**Deputy Head of certification  
body "climate and energy"**



Abhishek Goyal

**Assessment Team Leader  
(ATL)**


## **Annex 1: Verification Protocol**

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## 1 PERIODIC VERIFICATION CHECKLIST

**Table 1: Data Management System/Controls**


Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
<b>1. Defined organizational structure, responsibilities and competencies</b>		
<b>1.1. Position and roles</b>	Full	<p>The overall authority of the project is personally supervised by Mr. M. S. Raghavendra, Director – International Power Corporation Limited (IPCL)</p> <p>Mr. M. S. Raghavendra has further, delegated responsibilities to site in-charge Mr. P.Madhusudan reddy and his team of, mechanical and electrical engineers, who are trained with large experience and academically qualified to carry out the task in shifts. The same is counter signed.</p> <p>In addition, Electricians and Fitters are trained in operation and maintenance of the plant and academically qualified to carry out the task.</p>
<b>1.2. Responsibilities</b>	Full	<p>The responsibilities are clearly defined as detailed in section 1.1 above and the same were verified for Mr. Sunil Kumar Reddy and Mr. Madesh Kumar, who are employed as shift engineers.</p>
<b>1.3. Competencies needed</b>	Full	<p>As the project employs qualified and trained engineers, all competencies needed meet the requirements, including that</p>

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		of operating personnel.
<b>2. Conformance with monitoring plan</b>		
<b>2.1. Reporting procedures</b>	Partial	<p>Electrical energy exported and imported by project activity is measured continuously using bi-directional energy meters installed on Line 1 and Line 2. The electricity exported and imported is sum of measurement at Line 1 and Line 2. Each line has two meters, one main meter and other check meter. The meters are installed at switchyard within the plant premises and are sealed by grid company. Monthly joint meter readings from main meters are used for emission reduction calculation and invoicing to grid company. In event of failure of main meter, readings from check meters are used. Energy exported and imported is also recorded in log sheets at project site by IPCL for each line separately.</p> <p>Export and import readings are also jointly recorded by project proponent (International Power Corporation Limited) and grid company (Karnataka Power Transmission Corporation Ltd.) in the monthly joint metering report and net electrical energy content exported to the grid is invoiced. Joint meter reading for each month forms the basis for calculation of emission reductions by the project activity. This parameter is most significant to determine the emission reductions from the project activity.</p> <p>Gross electricity generation and auxiliary consumption are also measured continuously using energy meters and recorded hourly in log sheets at project site. These parameters are not mentioned in monitoring plan of the registered PDD</p>


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		<p>and hence are not reported in the monitoring report.</p> <p><b><u>Clarification Request No. 1.</u></b> Please explain why there is no import from the KPTCL grid during July-06 to October 06, and make the same transparent in the Monitoring Report. In addition please include a statement quantifying planned and forced outages in the Monitoring Report.</p> <p><b><u>Corrective Action Request No.1.</u></b> As stipulated in the PDD, monitoring report should include information on number of people employed directly in the project activity.</p>
<b>2.2. Necessary Changes</b>	Partial	<p>The grid emission factor has been used as a predetermined default value, which has been defined in the registered PDD and confirmed during validation of the project. However, based on review of the registered PDD, it is difficult to understand whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification process.</p> <p><b><u>Corrective Action Request No.2.</u></b> Based on review of the registered PDD, audit team is of the opinion that monitoring plan in the registered PDD is not consistent within itself and with other sections of the PDD. It is difficult to understand whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification process. To remove the inconsistencies, revised monitoring plan should be submitted to CDM EB.</p>


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<b>3. Application of GHG determination methods</b>		
<b>3.1. Methods used</b>	Full	The calculation procedures reflect the monitoring plan content. Export and import readings are jointly recorded in the joint metering report and net electrical energy content exported to the grid is invoiced. This parameter is most significant to determine the emission reductions from the project activity.
<b>3.2. Information/process flow</b>	Full	The necessary procedures have been defined in the power purchase agreement (PPA) and additional internal documents relevant for the determination of the electricity exported to the grid.
<b>3.3. Data transfer</b>	Full	The necessary procedures have been defined in the PPA and additional internal documents relevant for the determination of the electricity exported to the grid.
<b>3.4. Data trails</b>	Full	The necessary procedures have been defined in the PPA and additional internal documents relevant for the determination of the electricity exported to the grid.
<b>4. Identification and maintenance of key process parameters</b>		
<b>4.1. Identification of key parameters</b>	Full	The critical parameter for the determination of GHG emissions is the net amount of electricity exported to grid, which is based on electricity exported and imported.
<b>4.2. Calibration/maintenance</b>	Partial	The responsibility of calibration for the main meters and check meters on both lines lies with KPTCL. Calibration test has been done once during the one year monitoring period




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		<p>under consideration. Meters on line 1 have been tested on 29 December 2006 and that on line 2 have been tested on 6 January 2007.</p> <p><b><u>Corrective Action Request No.3.</u></b> The monitoring report must state all the changes in meters carried out during the monitoring period with the reasons for such changes.</p> <p><b><u>Corrective Action Request No.4.</u></b> The accuracy % of the meter defined in the monitoring report is not correct. It is mentioned of 0.1% whereas actual meters are of 0.2%.</p> <p><b><u>Corrective Action Request No.5.</u></b> The meters with 0.2% accuracy level on Line 2 were not recalibrated until 6 January 2007, which is more than one year after previous calibrations conducted on 10 September 2005. Please clarify as to how the energy export and import from Line 2 can be considered appropriate for the monitoring period.</p>
<b>5. GHG Calculations</b>		
<b>5.1. Use of estimates and default data</b>	Partial	See Chapter 2.2
<b>5.2. Guidance on checks and reviews</b>	Full	No CDM specific internal audits are required as such because the monitoring and measurement of power exports and imports are done diligently every month as core business of the company and hence a permanent control of the figures

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		<p>in joint meter readings as well as invoices raised takes place. However company has a system of internal audit and reviews of findings at six months intervals. Last such audits were carried out in May 2006 November 2006.</p> <p>Quality assurance procedures are in place as for example the joint meter reports and respective billings are reviewed for accuracy and correctness by a staff member before submission. Staff was made aware of the quality assurance procedures.</p>
<b>5.3. Internal validation and verification</b>	Full	<p>No CDM specific internal audits are required as such because the monitoring and measurement of power exports and imports are done diligently every month as core business if the company and hence a permanent control of the figures in joint meter readings as well as invoices raised takes place. However company has a system of internal audit and reviews of findings at six months intervals. Last such audits were carried out in May 2006 November 2006.</p> <p>Quality assurance procedures are in place, for example the joint meter reports and respective billings are reviewed for accuracy and correctness by a staff member before submission. Staff was made aware of the quality assurance procedures.</p> <p>The audit team did verify the following parameters:</p> <ul style="list-style-type: none"> <li>• Energy export and import for line 1 and line 2 separately through joint meter recording sheets for each month</li> <li>• Invoices raised for the months</li> </ul>


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		<ul style="list-style-type: none"> <li>• Account documents for the payments received</li> <li>• Energy export and import for line 1 and line 2 measured and recorded in plant log sheets</li> <li>• Gross energy generation and auxiliary energy consumption for each unit measured at plant and recorded in log sheets.</li> </ul> <p>Energy export and import is in compliance with the figures stated in the monitoring report.</p>
<b>5.4. Data protection measures</b>	Full	The key parameters are measured by calibrated meters. All the data is transferred to the Head Office at Bangalore, India, on a monthly basis and kept protected.
<b>5.5. IT systems</b>	Full	The IT system is based on standard PC and MS-office solutions. Hence the verification team feels confident about its use.


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**Table 2: GHG calculation procedures and management control testing**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Potential reporting risks based on an assessment of the emission estimation procedures can be expected to occur in the following fields of action:</p> <p>1. Calculation methods,</p> <p>Key source of data applicable to the project assessed are hereby:</p> <ul style="list-style-type: none"> <li>• Joint meter reading records</li> <li>• Accounting records (from invoices raised for net electricity export),</li> </ul> <p>Appropriate calibration and maintenance of equipment resulting in a high accuracy of data supplied should be in place.</p> <p>It is hereby needed to focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include:</p> <ul style="list-style-type: none"> <li>Ø manual transfer of data/manual calculations,</li> <li>Ø position of metering equipment</li> <li>Ø unclear origins of data,</li> <li>Ø accuracy due to technological limitations,</li> </ul>	<p>Regarding the potential reporting risks identified in the left column the following mitigation measures have been observed during the document review and the on site mission:</p> <p>Raw data collection:</p> <p>As the project is hydro power based, the net amount of electricity exported to the grid remains to be the only parameter to be obtained for the GHG calculation.</p> <p>Key source data for this parameter are:</p> <ul style="list-style-type: none"> <li>• Joint meter readings</li> <li>• Invoices</li> </ul> <p>The meters are installed in the switchyard within the plant premises and this is a restricted area. The metering panel for the main meters and the check meters are sealed sheet metal enclosures. The meters are of reputed make in India.</p> <p>The allocation of responsibilities is documented in a written form.</p> <p>The necessary procedures have been defined in the power purchase agreement and additional internal documents relevant for the determination of the net</p>	<p>The issue remaining is whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification.</p>


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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
	electricity exported to the grid. Calculation methods: The calculation procedures reflect the monitoring plan content.	


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**Table 3: Detailed audit testing of residual risk areas and random testing**

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i> )
The issue remaining is whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification.	There has been a complete check of data transferred from readings and invoices to the calculation tool. There was no error in such transfer.	<p>Having investigated the residual risks, the audit team comes to the following conclusion:</p> <p>The risk involved in the metering are very low as the meter readings are taken jointly by KPTCL and IPCL, and these are recorded and maintained transparently and in a traceable manner.</p> <p>Immediate action is needed with respect to the following:</p> <p><b><u>Corrective Action Request No.1.</u></b> As stipulated in the PDD, monitoring report should include information on number of people employed directly in the project activity.</p> <p><b><u>Corrective Action Request No.2.</u></b> Based on review of the registered PDD, audit team is of the opinion that monitoring plan in the registered PDD is not consistent within itself and with other sections of the PDD. It is difficult to understand whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification process. To remove the inconsistencies, revised monitoring plan should be submitted to CDM EB.</p> <p><b><u>Corrective Action Request No.3.</u></b> The monitoring report must state all the changes in meters carried out during the monitoring period with the reasons for such</p>

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Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i> )
		<p>changes. In addition multiplication factor for each meter is to be included in the monitoring report.</p> <p><b><u>Corrective Action Request No.4.</u></b> The accuracy % of the meter defined in the Monitoring report is not correct. It is mentioned of 0.1% whereas actual meters are of 0.2%.</p> <p><b><u>Clarification Request No. 1.</u></b> Please explain why there is no import from the KPTCL grid during July-06 to October 06, and make the same transparent in the Monitoring Report.</p>

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**Table 4: Compilation of open issues**

Draft report corrective and forward action requests by audit team	Summary of project owner response	Audit team conclusion
<p><b><u>Corrective Action Request No.1.</u></b></p> <p>As stipulated in the PDD, monitoring report should include information on number of people employed directly in the project activity.</p>	<p>The information has been provided in the revised monitoring report.</p>	<p>Ⓟ</p>
<p><b><u>Corrective Action Request No.2.</u></b></p> <p>Based on review of the registered PDD, audit team is of the opinion that monitoring plan in the registered PDD is not consistent within itself and with other sections of the PDD. It is difficult to understand whether ex-ante or ex-post grid emission factor should be used for calculation of emission reductions during the verification process. To remove the inconsistencies, revised monitoring plan should be submitted to CDM EB.</p>	<p>Revised monitoring plan has been submitted to CDM EB.</p>	<p>Ⓟ</p> <p>Revised monitoring plan has been approved by CDM EB (<a href="http://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view">http://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view</a>). It is clear that ex-ante grid emission factor should be used for calculation of emission reductions during the verification process.</p>
<p><b><u>Corrective Action Request No.3.</u></b></p> <p>The monitoring report must state all the changes in meters carried out during the monitoring period with the reasons for such changes. In addition multiplication factor for each meter is to be included in the monitoring report.</p>	<p>There was an error in the readings of the tri-vector meter connected to Line 1. The readings were slightly higher than the permissible limits. The meter was released on 3<sup>rd</sup> April 2007 and sent to Manufacturer viz. Larson and Tubro Ltd. for rectification. The situation has been stated in the monitoring report</p> <p>Multiplication factor has now been</p>	<p><u>Response by audit team</u></p> <p>The main and check meters on line 2 were found to be within the acceptable limits of error as per calibration test conducted on 6 January 2007. However, the main and check meters on line 1 were found to be outside the acceptable limits of error as per calibration test conducted on 29 December 2006. Please clarify how the error has been considered in emission reduction calculations.</p>




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Draft report corrective and forward action requests by audit team	Summary of project owner response	Audit team conclusion
	included in the Monitoring report.	<p>It is not clear why the main meter that was found to be erroneous on 29 December 2006 was sent for rectification on 3 April 2007. Please clarify why the readings from main meter have been used for emission reduction calculations and invoicing during this period.</p> <p><u>Response by project proponent</u></p> <p>The meters used for energy metering at the project site are under the custody of KPTCL and the agency is responsible for testing and calibration of these meters. PP does not have any control on the meters testing/ calibration.</p> <p>During the testing of meters on 29<sup>th</sup> December 2006, the main meter in Line 1 was found to be working outside the permissible limit and KPTCL released the meter on 3<sup>rd</sup> April 2007, which in turn was sent to the manufacturer M/s Larson and Turbo Ltd. for rectification.</p> <p>During the tests of the meters on 29<sup>th</sup> December 2006, a maximum error of 0.6454127% was found in the Main meter and 2.2266469% in the Check meter.</p> <p>During the period i.e. upto March 2007, KPTCL continued with the same Main meter for billing purpose. From the month of April 2007, however</p>

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Draft report corrective and forward action requests by audit team	Summary of project owner response	Audit team conclusion
		<p>KPTCL took the readings of Check meter as the basis for net electrical energy export in Line 1.</p> <p>However, for conservative estimation of emission reductions from the project activity during the period from May 2006 – April 2007, net electrical energy export readings have been adjusted to accommodate the maximum errors in the meters. The errors have been discounted for the entire period under monitoring i.e. May 2006 – April 2007. This is most conservative.</p> <p>For the period between May2006 – Mar2007, an error of 0.6454127% (maximum error observed in the Main meter) and for the month of April 2007, an error of 2.2266469% (maximum error observed in Check meter) has been adjusted from the recorded net electrical energy export. This is most conservative.</p> <p>The difference between emission reductions with and without error consideration is about 143 CERs. Hence the revised emission reductions from the project activity for the monitored period is now 44522 (earlier figure 44665).</p> <p><u>Final response by audit team</u></p> <p>p</p> <p>The calibration tests were done on main and check</p>

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Draft report corrective and forward action requests by audit team	Summary of project owner response	Audit team conclusion
		<p>meters at Line 1 on 29 December 2006 for active power in export mode at Unity Power Factor (UPF), 0.86 lag and 0.5 lag for 100%, 50% and 10% load. The maximum positive error observed during calibration test of main meter was 0.645% at Unity Power Factor (UPF) with 100% load. Same has been conservatively applied for exported amount of electricity measured by main meter from May 2006 to March 2007. The minimum negative error was -0.153 at UPF with 10% load.</p> <p>The error in import mode was within acceptable limits. It must be noted that the main meter was measuring energy without errors from May 2006- November 2006 since the difference between the main and check meter readings during this period was very small in the range of 0.04 to 0.09%. The error occurred in main and check meter readings only during December 2006 which was evident by difference between readings of two meters. Even after the error was observed, the buyer, KPTCL was purchasing electricity based on erroneous main meter reading up to March 2007. The main meter has been sent for re-calibration on 3 April 2007. For month of April the electricity has been purchased by KPTCL based on erroneous check meter reading. Hence it is very conservative to apply the maximum observed positive error to meas-</p>


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Draft report corrective and forward action requests by audit team	Summary of project owner response	Audit team conclusion
		ured amount of electricity exported through Line 1 for period during May 2006 to March 2007. The maximum positive error observed during calibration test of check meter was 2.226% at 0.86lag with 100% load. Same has been conservatively applied for exported amount of electricity measured by check meter for April 2007. The minimum negative error was -5.823 at UPF with 50% load.
<p><b><u>Corrective Action Request No.4.</u></b></p> <p>The accuracy % of the meter defined in the Monitoring report is not correct. It is mentioned of 0.1% whereas actual meters are of 0.2%.</p>	The accuracy level has been corrected as 0.20% in the revised monitoring report.	␣
<p><b><u>Corrective Action Request No.5.</u></b></p> <p>The meters with 0.2% accuracy level on Line 2 were not recalibrated untill 6 January 2007, which is more than one year after previous calibrations conducted on 10 September 2005. Please clarify as to how the energy export and import from Line 2 can be considered appropriate for the monitoring period.</p>	An error of 0.1941862% in export mode (maximum error observed in the export mode of main meter) and an error of 0.1863014% in import mode (maximum error observed in the import mode of the main meter) have been observed during testing of meter which was well within the permissible error margin. However there was a time lag of four months from the required date of calibration, so for conservative estimations, an error of 0.2% (maximum permissible error) has been adjusted from the recorded	␣ A correction based on the maximum inaccuracy specification of the meters i.e. (±) 0.2% for export and import energy units has been applied. The total energy export for the monitoring period has been reduced by 0.2% whereas the total energy import has been increased by 0.2%. Same calculation is also transparently defined in the revised monitoring report. This is considered conservative approach by audit team.


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Draft report corrective and forward action requests by audit team	Summary of project owner response	Audit team conclusion
	net electrical energy export/ import to/ from the grid. This is the most conservative.	
<p><b><u>Clarification Request No. 1.</u></b></p> <p>Please explain why there is no import from the KPTCL grid during July-06 to October 06, and make the same transparent in the Monitoring Report.</p>	<p>During the period July-06 to October 06 the generation was taking place without interruption. Hence no import was made from KPTCL. A Statement quantifying planned and forced out-ages is included in the revised Monitoring Report.</p>	<p>o</p>

## **Annex 2: Information Reference List**

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Reference No.	Document or Type of Information
1.	On-site interviews at the Project Site of International Power Corporation Limited on 26 May 2007 by auditing team of TÜV SÜD  Verification team on site:  Sunil Kathuria                      GHG Auditor, TUV SUD South Asia  Interviewed persons:  Mr. P. Madhusudhan Reddy              Plant Incharge,              International Power Corporation Limited (IPCL) Mr. Y. Sunil Kumar Reddy              Mechanical Engineer, International Power Corporation Limited (IPCL) Mr. Madesh Kumar                      Electrical Engineer,              International Power Corporation Limited (IPCL)
2.	Registered Project Design Document for project activity, "18 MW Kemphole Mini Hydrel Scheme by International Power Corporation Limited, India"
3.	UNFCCC homepage <a href="http://www.unfccc.int">http://www.unfccc.int</a>
4.	Monitoring report for the period 01.05.2006 to 30.04.2007, IPCL submitted May 2007
5.	Internal Audit Report, IPCL, submitted on 26.05.2007.
6.	Monthly Bill Payment records towards Energy received, State Power Procurement Co-ordination Centre, submitted on 26.05.2007.
7.	Invoice for Power Purchase, submitted on 26.05.2007.
8.	Test Report for Energy Meter, Power Solutions, submitted on 26.05.2007.
9.	Details of Meters, Karnataka Power Transmission Corporation Limited, submitted on 26.05.2007.
10.	Correspondence regarding check meter, Karnataka Power Transmission Corporation Limited, submitted on 26.05.2007.
11.	Sample of hourly/daily record of generation, IPCL, dated 14.12.06, submitted on 26.05.2007.
12.	Export Energy Calculation, IPCL, submitted on 26.05.2007.
13.	Joint Meter reading for Line 1, Karnataka Power Transmission Corporation Limited and IPCL, submitted on 26.05.2007.
14.	Joint Meter reading for Line 2, Karnataka Power Transmission Corporation Limited and IPCL, submitted on 26.05.2007.

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Reference No.	Document or Type of Information
15.	Breakdown Maintenance for the year 2006-2007, submitted on 26.05.2007.
16.	Annexure – 1 Details of outages, IPCL, submitted on 26.05.2007.
17.	Details of Generation Report, IPCL, submitted on 26.05.2007.
18.	Revised Final Monitoring Report for the period 01.05.2006 to 30.04.2007, IPCL, dated 25 June 2008.
19.	Revised Final Monitoring Report for the period 01.05.2006 to 30.04.2007, IPCL, dated 31 July 2008.