



VALIDATION REPORT

SWASTI POWER ENGINEERING LTD

22.5 MW BHILANGANA HYDRO POWER PROJECT (BHPP)

Report No: 5320406 – 06/18

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Validation Report:

22.5 MW Bhilangana Hydro Power Project (BHPP)

TÜV NORD JI/CDM Certification Program

P-Nr.: 5320406-06/18



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| Approved by: Mr. W. Wielpütz | Organisational unit: TÜV NORD JI/CDM Certification Program |
| Client: Swasti Power Engineering Ltd. | Client ref.: Mr Y. S. Raveendranath Reddy (Managing Director) |

Summary/Opinion:

The Swasti Power Engineering Private Ltd., has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: "22.5 MW Bhilangana Hydro Power Project (BHPP)", with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), and the relevant decisions by COP/MOP and CDM Executive Board.

The run-of-the river hydroelectric project intends to reduce GHG emissions to the extent of electricity displaced from the northern regional grid of India.

A risk-based approach has been followed to perform this validation. In the course of the draft validation 9 Corrective Action Requests (CARs) and 8 Clarification Requests (CRs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval has been obtained from National CDM Authority as DNA of India vide the Letter of Approval (HGA) dt 03 March 2006.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 1,093,040 t CO_{2e} is most likely to be achieved within the 10 years (fixed) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

| | |
|--|--------------------------------------|
| Report No.: 5320406-06/18 | Subject Group: Environment |
| Report title: 22.5 MW Bhilangana Hydro Power Project (BHPP) | |
| Work carried out by: Rainer Winter Asim Kumar Jana Manu Maudgal Ashok Chopra | |
| Work verified by: Wolfgang Wielpütz | |
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Indexing terms

Climate change
CDM
Validation
Kyoto Protocol

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Abbreviations

| | |
|------------------------|---|
| BAU | Business as usual |
| BHPP | Bhilangana Hydropower Project |
| CA | Corrective Action / Clarification Action |
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CEA | Central Energy Authority |
| CER | Certified Emission Reduction |
| CO₂ | Carbon dioxide |
| CO_{2e} | Carbon dioxide equivalent |
| CP | Certification Program |
| CR | Clarification Request |
| DNA | Designated National Authority |
| EB | CDM Executive Board |
| EIA | Environmental Impact Assessment |
| E&Y | Ernst & Young |
| GHG | Greenhouse gas(es) |
| IPCC | Intergovernmental Panel on Climate Change |
| IPP | Independent Power Producer |
| IRR | International Rivers Network |
| kW | Kilowatt |
| kWh | Kilowatt hour |
| m | meter |
| m/s | meter/second |
| MW | Megawatt |
| MWh | Megawatt hour |
| MU | Million Units (of electricity) |
| NATCOM | India's Initial National Communication to the UNFCCC |
| NCV | Net Calorific Value of Fuel |
| NREB | Northern Regional Electricity Board |
| NRLDC | Northern Regional Load Dispatch Centre |
| ODA | Official Development Assistance |
| PDD | Project Design Document |
| QC/QA | Quality control/Quality assurance |
| SHP | Small-Scale Hydro Project |
| SPEL | Swasti Power Engineering Private Ltd. |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UJVNL | Uttaranchal Jal Vidyut Nigam Ltd |

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1 INTRODUCTION

Swasti Power Engineering Limited (SPEL), facilitated by Ernst & Young Pvt Ltd (E&Y), has commissioned the JI/CDM Certification Program (CP) of TÜV NORD CERT GmbH to validate the project:

“22.5 MW Bhilangana Hydro Power Project (BHPP)”

with regard to the relevant requirements for CDM project activities.

1.1 Objective

The purpose of this validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol^{/KP/};
- the CDM modalities and procedures as agreed in the Marrakech Accords under decision 17/CP.7^{/MA/}; the annex to the decision;
- subsequent decisions made by COP/MOP & CDM Executive Board,
- other relevant rules, including the host country (India) legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on ACM 0002/Version 06: Consolidated baseline/monitoring methodology for grid-connected electricity generation from renewable sources), which are included in the PDD^{/PDD1/} and other relevant supporting documents.

The items covered in the validation are described below:

- **UNFCCC & Host Country Criteria**

- UNFCCC/Kyoto Protocol requirements, in particular,
 - the requirements of the CDM as set out in decision 17/CP.7 (Marrakech Accords)^{/MA/},
 - the present annex, and
 - relevant decisions by COP/MOP & CDM Executive Board
- Host country requirements / criteria

- **CDM Project Description**

- Project design
- Project boundaries

- Predicted CDM project GHG emissions
- **Project Baseline**
 - Baseline methodology
 - Baseline GHG emissions
- **Monitoring Plan**
 - Monitoring methodology
 - Indicators/data to be monitored and reported
 - Responsibilities
- **Background investigation and follow up interviews**
- **Global Stakeholder consultation**
 - Publishing the PDD on TUV NORD website
 - Review of comments
- **Draft validation reporting with CARs & CRs, if any**
- **Final validation reporting.**

The information included in the PDD and the supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD CERT GmbH JI/CDM CP has, based on the recommendations in the Validation and Verification Manual^{VVM}, employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs^{CPM}. The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions.

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

1.3 GHG Project Description

1.3.1 Project Scope

The considered GHG project can be classified as a CDM project in the sector given in Table 1-1 (according to List of Sectoral Scopes of UNFCCC).

Table 1-1: Project Scope

| No. | Project Scope |
|-----|---|
| 1 | Energy Industries (renewable - / non-renewable sources) |

1.3.2 Project Entities

The following entities are involved in the developing of the project:

| | |
|----------------------------|--|
| Project Proponent: | Swasti Power Engineering Ltd (SPEL) 324/B, MLA & MP Colony Road 10C, Jubilee Hills Hyderabad, Andhra Pradesh PIN- 500 033, India |
| Contact person: | Mr. Y. S. Raveendranath Reddy (Managing Director) Managing Director +91-40-23556656/57, +91-9440185585 raviyeduguri@hotmail.com |
| Project Consultant: | Ernst & Young Pvt Ltd Risk and Business Solutions Ernst & Young Tower B-26, Qutab Institutional Area New Delhi- 110 016, India |
| Contact Person: | Rajesh Miglani (Manager) +91-11-41594251, +91-9810888024 rajesh.miglani@in.ey.com |

1.3.3 Project location

The project site is located a few kilometres North of Ghansali township (Longitude 78°34'30"E, Latitude 30°25'41"N) in the state of Uttaranchal, India. The project site is about 45 kilometres from the origin of River Bhilangana.

1.3.4 Technical project description

The project activity involves setting up a 22.5 MW (3X7.5 MW) run-of-the river type hydroelectric power project on perennial river, Bhilangana (a major tributary of the River Bhagirathi) for generation of grid-connected electricity. The net electricity generated out of this 22.5 MW hydroelectric plant will be exported, under Power Purchase Agreement^{/PPA/} made with Power Trading Corporation, to the Northern grid of India.

This run-of-the river project envisages generating 121.956 GWh of electricity per year. The project activity indirectly helps in reducing the power deficit in the region and reduces the GHG emission. The project activity also contributes towards meeting the objective of Government of India about 10% of incremental capacity from renewable sources^{/imnce/}.

As the run-of-the river project is a renewable energy project, the project is intended to reduce CO₂ emissions to the extent of equivalent net electricity generated by mostly fossil fuel based power plants connected to the northern grid of India.

The estimated amount of emission reductions over the chosen 10-year “non-renewable crediting period” is **1,093,040 tCO_{2e}** for the crediting period 2007-04-16 to 2017-04-15.

2 VALIDATION TEAM

- The Validation Team was led by **Mr. Rainer Winter**. Mr. Winter works at TÜV NORD as ISO 9001/ 14001 Auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. Mr. Winter is an authorized JI/CDM assessor and is in charge of the TÜV NORD JI/CDM CP. For this validation he was assisted by:
- **Asim Kumar Jana**, TÜV Nord -Mumbai, India. Mr. Jana, M.Tech (Env Engg), Dipl in Industrial Safety, is a TUV-CERT Lead auditor for ISO 9001/14001 and OHSAS 18001 and certified energy auditor by Bureau of Energy Efficiency of India. Currently he is Manager-CDM Services for TÜV NORD India operation. He is an appointed assessor for TÜV NORD JI/CDM CP and performed validation and verification of several CDM projects.
- **Manu Maudgal**, TÜV Nord- Delhi, India is TÜV -CERT auditor for ISO 14001 and OHSAS 18001. He has received extensive training in the CDM validation & verification process. He is an appointed trainee for JI/CDM certification program of TÜV NORD CERT GmbH.
- **Ashok Chopra**, TÜV Nord -Delhi, India is TUV-CERT Lead auditor for ISO 9001/14001 and OHSAS 18001. He has received extensive training in the CDM validation & verification process. He is an appointed trainee for JI/CDM certification program of TÜV NORD CERT GmbH.

The validation report is verified by:

- **Mr. Wolfgang Wielpütz**. He is ISO 9001 and ISO 14001 auditor, environmental verifier for EMAS and DEHSt- appointed emission verifier in the framework of EU-ETS. He is appointed JI/CDM assessor. Mr Wielpütz is the head of the department: “Integrated management systems, environmental and occupational safety” and the deputy chief of TÜV NORD CERT GmbH.

3 METHODOLOGY

The validation of the project was carried from May’06 to October’06. it was divided into two phases: the pre-validation and the validation phase. The pre-validation consisted of the following three phases:

- A desk review of the PDD (incl. annexes) and supporting documents with the use of a customised validation protocol^{/CPM/} according to the Validation and Verification Manual^{/VVM/};

- Back ground investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders;
- Reporting of validation findings taking into account the public comments received on TUV NORD website.

The draft validation report includes Corrective action and Clarification Requests (CAR and CR) identified in the course of this validation.

A **Corrective Action Request** is established if

- mistakes have been made in assumptions or the project documentation which directly will influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions cannot be verified and certified.

A **Clarification Request** is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

The final validation started after issuance of proposed corrective action (CA) of these CAR and CR by the project proponent. The validator has assessed the proposed CA with a positive result and after the closure of these CAR and CR the project proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

the baseline methodology applied to the project activity is based on approved consolidated baseline and monitoring methodology ACM 0002/Version 06: for grid-connected electricity generation from renewable sources.

3.1 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements that a CDM project is expected to meet;
- It ensures a transparent validation process where the independent entity will document how a particular requirement has been validated and the result of the determination.

The validation protocol consists of three tables: Table 1 (Mandatory Requirements); Table 2 (Requirement Checklist); and Table 3 (Resolution of Corrective Action and Clarification Request) as described in Figure 1.

The completed (till draft conclusion) validation protocol is enclosed in Annex I to this report identifying 9 Corrective Action Requests and 8 Clarification Requests.

| Validation Protocol Table 1: Mandatory Requirements | | | |
|--|---|---|---|
| Requirement | Reference | Conclusion | Cross reference |
| The requirements the project must meet. | Gives reference to the legislation or agreement where the requirement is found. | This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report. | Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process. |

| Validation Protocol Table 2: Requirement checklist | | | | |
|---|---|--|--|---|
| Checklist Question | Reference | Means of verification (MoV) | Comment | Draft and/or Final Conclusion |
| The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question. | Gives reference to documents where the answer to the checklist question or item is found. | Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable. | The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached. | This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification is used when the validation team has identified a need for further clarification. |

| Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests | | | |
|---|--|--|--|
| Draft report clarifications and corrective action requests | Ref. to checklist question in table 2 | Summary of project owner response | Validation conclusion |
| If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section. | Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained. | The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section. | This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion". |

Figure 1: Validation protocol tables

3.2 Review of Documents

The draft PDD^{/PDD1/} submitted by the BHPP in May 2006 and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The documents that were considered during the (pre-) validation process are given in chapter 7 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 7-1)
- Background investigation and assessment documents (Table 7-2)
- Websites used (Table 7-3).

In order to ensure the transparency of the decision making process, the reference codes listed in tables 7-1 to 7-3 are used in the validation protocol and – as far applicable – in the report itself.

3.3 Follow-up Interviews

Starting 08th June 2006, the TÜV NORD JI/CDM CP performed the validation interviews with the project proponent, project developer, plant operating personnel and local authorities to confirm selected information and to resolve issues identified in the document review.

The key interviewed persons and the main topics of the interviews are summarised in Table 3-1.

Table 3-1 Interviewed persons and interview topics

| Interviewed Persons / Entities | Interview topics |
|---|---|
| Project proponent representatives (Head office and site) | <ul style="list-style-type: none"> - Chronological description of the project activity - Technical details of the project realisation - Host Government Approval - Approval procedures and status - Quality management system - Monitoring and measurement equipment - Crediting period and its starting date - Project activity starting date - Power purchase agreement - Sustainable development issues - Hydro geological survey - Analysis of local stakeholder consultation - Operational data – technical specification (capacity |

| Interviewed Persons / Entities | Interview topics |
|--|---|
| | <ul style="list-style-type: none"> of turbine), startup power supply, water availability, plant load factor. - Training & competency of the staff members w.r.t project management, monitoring and reporting - Emergency response plan |
| Project Developer | <ul style="list-style-type: none"> - Editorial aspects of PDD - Procedural aspects - Baseline study and additionality - Details of emissions reduction calculation |
| Local Villagers and leaders | <ul style="list-style-type: none"> - Stakeholder consultation - Environmental issues like Water availability - Socio-economic issues / benefits because of project |
| Local Authorities (Sub-divisional magistrate, Village Pradhans) | <ul style="list-style-type: none"> - Stakeholder consultation - Socio-economic issues / benefits because of project - Status of implementation of agreements |

A detailed list including the functions or designations of the interviewed persons is given in chapter 7 (see. Table 7-4). This table also includes reference codes to be used in the validation protocol.

3.4 Resolution of Clarification and Corrective Action Requests

In order to remedy any mistakes, problems or any other outstanding issues which needed to be clarified for positive conclusion on the project design, CARs and CRs were raised.

In this validation report 9 CARs and 8 CRs are raised.

The CARs / CRs are documented in Annex I and addressed in section 4.

3.5 Public Stake Holder Comments

The PDD was made publicly available through TÜV NORD JI/CDM CP web site www.global-warming.de. Comments on the PDD were invited within 30 days, i.e. 19/05/2006 to 17/06/2006.

The received comments were also made publicly available on the same site with a hyperlink with UNFCCC. The comments received from one stakeholder were reviewed and taken into account during the course of validation. The summary of the comments is presented in section 5.

3.6 Finalising the report

The draft validation report containing a set of CARs & CRs was submitted to the project proponent. The project design document was revised addressing the CARs & CRs issued by TÜV NORD JI/CDM CP. After reviewing the revised and resubmitted project documentation^{/PDD2/}; resolving the CRs & CARs raised and outstanding concerns, TÜV NORD JI/CDM CP issues this final validation report and opinion.

4 VALIDATION FINDINGS

In the following paragraphs the findings from the desk review of the draft PDD^{/PDD1/}, visits, interviews and supporting documents are summarised. This also includes the corresponding corrective action taken by the client and its final assessment.

The results are shown in table 4-1:

Table 4-1: Summary of CAR and CR issued

| Validation topic ¹⁾ | No. of CAR | No. of CR |
|------------------------------------|------------|-----------|
| Participation requirements (A3) | 0 | 0 |
| Project design (A1-A2) | 0 | 1 |
| Baseline and additionality (B) | 4 | 5 |
| Crediting Period (C) | 0 | 0 |
| Monitoring plan (D) | 1 | 1 |
| Calculation of GHG emissions (E) | 1 | 1 |
| Environmental impacts (F) | 1 | 0 |
| Comments of local stakeholders (G) | 2 | 0 |
| SUM | 9 | 8 |

¹⁾ The letters in brackets refer to the validation protocol

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.1 Participation Requirements

India as a non Annex-I party meets all relevant participation requirements. In the Letter of Approval^{/HGA/} dt. 2006-03-03, the Indian DNA, National CDM Authority under Ministry of Environment & Forests confirmed the voluntary participation of Swasti Power Engineering Limited as Project Participant in the CDM project activity.

An Annex-I party will be identified by the project participant in due time, as per the post registration involvement by Annex I party provisions (no. 57) made in 18th EB meeting.

4.2 Project design

The objective of this 22.5 MW (3X7.5MW) run-of-the river type hydroelectric power project on perennial river, Bhilangana (a major tributary of the River Bhagirathi) is the generation of environmentally clean electricity and contributes towards meeting the regional power requirements.

Except for some local purposes like flour mills which harness the running water to run the mills, the water potential of the river remains un-utilized. The net electricity generated out of this 22.5 MW hydroelectric plant will be exported, under Power Purchase Agreement made with Power Trading Corporation, to the Northern grid of India.

The scheme comprises of Boulder Weir 44 m long and 5 m high with an intake structure to divert and regulate the waters into the 594.17 m long horse shoe shaped interconnecting tunnel, which leads the water into a 117 m long, 12.6 m wide and 16 m high D-shaped underground desilting tank. The silt free water is led to a surge shaft via a 4.0 m dia horse shoe shaped Head Race Tunnel (HRT), which is in two parts namely HRT-1 and HRT-2 with an aqueduct in between the two tunnels for crossing of the Phelenda Nala. HRT-2 terminates into the circular surge shaft of 12 m dia and 39 m high.

Following the surge shaft at the exit portal emerges a single steel penstock of 3.25 m dia and 370 m long, which trifurcates into three branches of 1875 m dia just before entering the powerhouse. The powerhouse is a surface type power house, which houses three Francis type turbo generators – each of 7.5 MW capacity. The tail water emerging out from the three machines is led back to Bhilangana River via a short tailrace channel.

As stated in the PDD, the project activity would be incorporating some of the latest / state-of-the-art technologies available in the field of hydro electric power generation i.e.:

- Use of digital turbine governors for speed regulation of hydro turbines
- Computerised Control System for control of generating unit, station & units, auxiliaries, H. V. Switchgear, Intake Gates etc.
- Gas Insulated Switchgear as it involves minimum maintenance and much lesser space to install.

No import of technology is involved in the project activity.

According to sustainable development various social, economic and environmental benefits are achieved. Rural and infrastructural development was obtained through implementation of the project activity. The project activity would result in the employment of the local people during the construction and operation phases. Besides GHG mitigation the project activity leads to conservation of natural resources. Since it is a run-of-the river project there is no storage, involving no submergence and deforestation. The project is currently under the construction stage and expecting commissioning by April 2007.

The existing power plants in the region are operated by the state authority and as per the latest available statistics there is no independent power producer in the state of Uttaranchal as per the available statistics on hydro electric plants given by Central Electricity Authority (CEA). The BHPP activity will be the first of its kind independent power producer (IPP) of its size coming up in the state of Uttaranchal. The BHPP activity would thus be setting precedence and would encourage other private investors to come up for the development of the hydro power potential existent in the state of Uttaranchal.

This type of project activity is in line with sustainable development policies of the country and national regulation / policy on Environmental Protection, Electricity and Non Conventional Energy.^{/HGA/}. Nevertheless in the Host Government Approval it is stated that SPEL has to comply with the following conditions:

- SPEL shall not sell the CERs to any agency/ company/ organization which purchases the CERs using ODA Funds
- SPEL shall inform the national CDM Authority regarding all transaction details of CERs including the name and address of the party to which CERs were sold within 30 days of transfer of the CERs
- SPEL shall furnish expeditiously any information, during the lifetime of the project as requested by the National CDM Authority.
- SPEL shall obtain all statutory clearances and other approvals as required from the competent authorities for setting up of the project
- All transaction shall be subject to supervision of the Executive Board of the CDM, under the authority and guidance of the COP/MOP

Based on the financial information furnished by the project participants, no ODA does contribute to the financing of the project.^{/BLS/}

The geographical (a few kilometres North of Ghansali township, District Tehri Garhwal) and temporal boundaries (10 years crediting period, 35 years operational lifetime) are clearly defined.

In the course of the project validation the following CAR and CR - regarding the project design and the correct completion of the PDD - were raised and successfully closed out.

| Clarification Request A1: | |
|----------------------------------|--|
| CR | The figure of estimated net electricity supply, i.e., 130.59 GWh in the PDD does not match with the figure in the Detail Project Report (Vol-I, page 21/166), i.e., 121.956 GWh. Clarification is requested. The basis of the estimated figure requires to be justified. |
| CA: | The generation figure has been updated as stated in the DPR, page 21, Volume-1, April 2004, i.e., 121.956 GWh. The DPR has been prepared after an in-depth study of hydrology, topography, geo-technical investigations detailed discussions with civil contractors and equipment suppliers. Please refer the revised PDD and the baseline excel sheets. |
| Conclusion: | DPR; the revised calculations in the PDD and the baseline excel sheets were verified and found OK. |

4.3 Baseline and Additionality

The selected baseline methodology is the approved consolidated baseline methodology for grid-connected electricity generation from renewable sources ACM0002.

Nevertheless the following CARs and CRs had to be raised:

| Corrective Action Request B1: | |
|--------------------------------------|---|
| CAR | The version number of ACM0002 mentioned in the section B & D of the PDD is not current, ie, version 06. |
| CA: | The version number has been updated in the revised PDD. |
| Conclusion: | OK |

The baseline under the adopted methodology ACM0002 requires use of latest grid information from official sources. Accordingly the following CAR had to be issued.

| Corrective Action Request B2: | |
|--------------------------------------|---|
| CAR | The values of the 'total low cost power generation' for the years 2002-03, 2003-04, 2004-05 in Annex-3 is incorrect and the data vintage should be updated for the recent available official data source, i.e., for the year 2005-06. |
| CA: | The necessary corrections have been made in Annex-3. Please refer the revised PDD and updated baseline excel sheets. |
| Conclusion: | The correction made in the Annex-3 table and the baseline excel sheet are OK. |

Further the inconsistencies in language and updating of referred information in the PDD was addressed by the following CARs.

| Corrective Action Request B3: | |
|--------------------------------------|---|
| CAR | The references of the Tehri Dam are in-appropriate for this run of river project activity and the section B.3 should be appropriately corrected. |
| CA: | The reference of Tehri Dam has been given in light of the fact that inundation fear had crept into the mind of the people due to the proximity of the two projects. The local people have been informed that the project being a run-of the river project does not involve water storage hence no inundation would occur. |
| Conclusion: | The corrections and justifications made in section B.3 of PDD are convincing to the validation team. |

Corrective Action Request B4:

| | |
|-------------|--|
| CAR | The figure of existing hydropower capacity in India at 27 000 MW stated in step 4 of section B.3 of the PDD is outdated (Cp. www.powermin.nic.in). Moreover, the values for installed hydropower in Uttaranchal (Page 10 and 11 of the PDD), ie, 954.15 MW contradicts with the values in page 13, ie, 1478.24 MW. The “Monthly reports (March 2006)” of the CEA show for Uttaranchal: 978 MW (State Sector) and additional 400 MW (Central Sector / NHPC) – and the Theri Powerstation with 0 MW because it don’t work – so the capacity is much more than 954.15 MW total installed hydropower in Uttaranchal. |
| CA: | As the figures mentioned are outdated so the same have been removed in the revised version of the PDD. In the context of the revised PDD the earlier data is not relevant. |
| Conclusion: | The corrections made and context for revising the PDD are OK. |

Clarification Request B1:

| | |
|-------------|--|
| CR | The official data sources for power generation mix of northern region for 00-01 & 01-02 years in Annex 3 of the PDD are not mentioned. |
| CA: | Please refer the baseline excel sheets and the revised PDD for the reference of the data sources. The generation mix of northern region for 00-01 and 01-02 has been obtained from Northern Regional Load Dispatch Center (NRLDC) annual reports 2000-01 and 2001-02 respectively. |
| Conclusion: | The revisions in Annex 3 of the PDD and the baseline excel sheets are OK. Moreover, the 2000-01 data is no longer relevant as the latest 2005-06 data has also been incorporated. CR is closed. |

The baseline under the adopted methodology ACM0002 is calculated by multiplying the electricity baseline emission factor (EF_y) and the electricity exported to the Northern grid (EG_y). The electricity baseline emission factor (EF_y) is estimated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors. In this case the Combined Margin (weighted average of Simple Operating Margin and Build Margin) is estimated based on three years average (03-04, 04-05, 05-06) of Simple Operating Margin and 20 % Build Margin of current year (05-06) in line with steps of ACM0002. The grid boundary w.r.t the connected state grid is Northern Regional Grid of India.

The calculation of the operating margin, build margin was sound and transparently given in the PDD (Annex-3) as well as the underlying spreadsheet. The validation team has checked the underlying input values as well as the spreadsheet programming. As a result of the check the validation team is convinced of the result of the emission coefficient calculation. It is deemed to be adequate and transparent.

The weighted average of emission factors (Simple OM and BM) is calculated to be 896.26 tCO₂/GWh.

Relevant national & sectoral policies have been considered such as decisions of the Uttaranchal Jal Vidyut Nigam and the energy policy of the Government of India. The project is also in line with Non Conventional Energy Policies.

Nevertheless, the following CRs called for explanation on the non-inclusion of imports in the calculations and the justification for the use NCV data sourced from India's Initial National Communication to the UNFCCC (NATCOM).

| Clarification Request B2: | |
|----------------------------------|---|
| CR | The imports from the connected electricity system is not accounted for the simple operating margin (cp D.2.1.4 of the PDD & the excel calculation sheet). |
| CA: | The import data has been incorporated in the revised PDD and baseline excel sheets. |
| Conclusion: | OK |

| Clarification Request B3: | |
|----------------------------------|---|
| CR | ACM 0002 requires using local values of NCV and CO ₂ emission factor, where available. If no such values are available, country specific values (see e.g. IPCC Good Practice Guidance) are preferred to IPCC world-wide default values. The use of NCV value of coal (4593 kcal/kg) from NATCOM Report (containing 1994 data) is not justified in the context of local; national as well as current compared to India specific values published by Central Electricity Authority (Cp General Review Report 2006, 2005, 2004 – chapter 6). |
| CA: | <p>The Natcom report is a recent report dated 16.06.2004. Natcom is India's Initial National Communication to the UNFCCC and the figures of calorific value of coal and emission factor for coal have been taken from the Natcom report available at the following link (http://www.natcomindia.org/pdfs/chapter2.pdf).</p> <p>Thus as per the methodology national value (Country specific) has been taken instead of IPCC default values.</p> <p>As per the methodology ACM0002, Net Calorific Value (NCV) is to be considered for emission factor calculation. The CEA review report gives the average calorific value and not the NCV. Thus Natcom value has been taken as the basis for calculation of the emission factor for coal as it specifically gives the India specific NCV of coal.</p> <p>The relevance (applicability) of the Natcom value is also strengthened by the usage of the same in registered CDM project. There is registered project using Natcom value for emission factor calculation (http://cdm.unfccc.int/UserManagement/FileStorage/PIU46TBNF15IHQASM U1B5TJBWAE9WP, page 11 of 30).</p> |
| Conclusion: | The date of the report has been verified from the report foreword, in the web-link provided. Natcom gives a national value and is from its latest report. Data relevance has been checked from the registered project PDD reference available on web-link provided. CR is closed. |

| Clarification Request B4: | |
|---------------------------|---|
| CR | The coal generation figure, ie, 240570.42MU in the 02-03 generation sheet does not match with Emission Factor sheet, ie, 98724.42 MU. The similar mismatch of 04-05 gas generation figures (14362.83 vs 19890.00). This is based on sample check. |
| CA: | The values have been rechecked and have been found to be correct. |
| Conclusion: | OK |

In accordance with ACM0002, the additionality was demonstrated acc. to the latest version (ver 2) of the “Tool for demonstration and assessment of additionality”.

The arguments to justify the additionality were summarised in table 4-2. This table also includes the assessment of the validation team.

Table 4-2: Additionality assessment

| Step1) | Argument PP | Assessment of the validation team | |
|--------|---|---|--|
| 0 | SPEL wishes to have the crediting period starting after the project gets registered. | step 0 does not apply to the BHPP activity | <input checked="" type="checkbox"/> step passed <input type="checkbox"/> step not passed <input type="checkbox"/> not applicable |
| 1a | Possible alternatives for the project activity are: 1. The project activity not undertaken as a CDM project; 2. A diesel based power project with equivalent power output; 3. A gas based power project with equivalent power output; 4. A coal based power project with equivalent power output; 5. Continuation of the current situation in the northern grid with no project activity or alternatives undertaken. | The alternative 5 could be justified as a realistic and credible alternative to the PP. All other alternatives given in the step 1a cannot be considered as realistic alternatives as alternative 1 faces several barriers as given in step 3 and the other alternatives are not viable due to price and/or availability of the fuel. So only alternative 5 remains as a plausible and credible alternative for the PP. | <input checked="" type="checkbox"/> step passed <input type="checkbox"/> step not passed <input type="checkbox"/> not applicable |
| 1b | The alternatives mentioned above are in compliance with the applicable legal and regulatory requirements. | All alternatives are in line with the national regulations. | |

| Step1) | Argument PP | Assessment of the validation team | |
|--------|---|---|---|
| 2 | N/A | N/A | <input type="checkbox"/> step passed <input type="checkbox"/> step not passed <input checked="" type="checkbox"/> not applicable (step 3 has to be passed) |
| 3a | Investment barriers: Hydrological risks – Bhilangana is a snow-fed as well as rain-fed river and carries discharges all year round but there was absence of long-term hydrological data initially. The BHPP being a run-of-the river project, the generation from the project varies as per the pattern of the river discharges. Therefore, to arrive at the power potential short term discharge data was recorded and long term hydrological database for the Bhilangana basin was extracted from the data of Bhagirathi. Also, the Bhilangana's catchment area is prone to severe storms occasionally resulting into cloudbursts and associated flash floods which could damage the project. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | <input checked="" type="checkbox"/> step passed <input type="checkbox"/> step not passed <input type="checkbox"/> not applicable |
| | Geological risks – The BHPP lies in the seismic zone IV of the Seismic Zone Map of India. The Phalenda nala lies along a fault line from where the intake tunnel passes. This plane of fault could act as a zone for the release of earth strain. Displacement of rock on either side of the tunnel is possible and this movement could damage the project activity. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|--------|--|---|--|
| | Environmental risks - SPEL had the option of taking water to the powerhouse via a channel or a tunnel. Although the option of channel is economically cheaper to implement as compared to that of a tunnel, but it is environmentally more degrading and results in higher emissions during construction. Therefore, SPEL has opted for the tunnel route in spite of the fact that it requires higher investments but is an environmental friendly option. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | |
| | Implementation risks – The promoter group is not established in hydro power generation. This could lead to time/cost overruns for the project. The BHPP being in a hilly region with the associated hydrological and geological risks can result in time/cost over-runs due to lack of proper project management practices. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input checked="" type="checkbox"/> Argument justified but not decisive <input type="checkbox"/> Argument justified / significant | |
| | Transmission risks – The evacuation of power from the BHPP to the grid would require construction of a 39 km transmission line. This transmission line has to be laid in the hilly terrain which is a difficult task and involves significant investments. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input checked="" type="checkbox"/> Argument justified but not decisive <input type="checkbox"/> Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|--------|---|---|--|
| | <p>Barriers due to prevailing practice</p> <p>All small hydro power plants in Uttaranchal are operated by the state authority and as per the latest available statistics there is no independent power producer. There is no private party producing power in the state of Uttaranchal as per the available statistics on hydro electric plants given by Central Electricity Authority (CEA). The BHPP activity will be the first of its kind independent power producer (IPP) of its size coming up in the state of Uttaranchal. The BHPP activity would thus be setting the precedence and thus would encourage other private investors to come up for the development of the tremendous hydro power potential existent in the state of Uttaranchal.</p> | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | |
| | <p>Other barriers</p> <p>In the downstream of the river Tehri dam has been constructed on the river Bhagirathi resulting in inundation of large area of land and displacement of the local populace. This has resulted in apprehensions in the mind of some of local populace that a hydro project essentially results in land inundation and displacements. So, some of them are against the putting up of this run-of-the river hydropower project although it does not involve any displacement.</p> | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input checked="" type="checkbox"/> Argument justified but not decisive <input type="checkbox"/> Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|--------|---|---|--|
| | <p>The region falls under seismically sensitive and unsafe zone therefore the apprehensions of destructions caused by the boulder weir and the tunnel can not be ignored. A 2 km long tunnel is to be built to take the river water to the turbine using blasting method. Blasting can cause minor to major landslide in the region. Even minor adjustment of rocks can cause relocation of natural water sources to further intensify the woes of the local population.</p> | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input checked="" type="checkbox"/> Argument justified but not decisive <input type="checkbox"/> Argument justified / significant | |
| | <p>Since the BHPP is located in a remote area so SPEL is facing problems in getting skilled manpower for the project. The reluctance of skilled people to come and work in a remote location is to be tackled by devising higher compensation structure.</p> | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | |
| | <p>The project is situated in the newly formed state of Uttaranchal, which was carved out from Uttar Pradesh in the year 2001. The project was allotted earlier by Uttar Pradesh and since it lies in Uttaranchal, so SPEL had to negotiate terms with the new state, i.e., Government of Uttaranchal (GoU). GoU took about 2 years to finalize its own power policy which was eventually brought out in December 2002. Owing to unclear policies of GoU, the formation of the new state and the time taken in crystallization of GoU's power policy, SPEL has faced many problems.</p> | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|--------|---|---|--|
| 3b | BHPP has many associated barriers in its successful implementation. The above mentioned barriers though do not prevent alternatives 2, 3 and 4 from happening. Alternative 5 wherein there is no investment involved and the status quo of the grid is maintained, i.e., Continuation of the current situation in the northern grid with no project activity is the most likely baseline scenario. | It can be assessed that the barriers would not prevent the alternatives 2-4 as given in step 1. As alternative 5 is the perpetuation of the status quo, the given barriers do not prevent this alternative. | |
| 4 a, b | As per the latest available statistics by the CEA of the total identified hydro-electric potential in the state of Uttaranchal is 18175 MW of which only 1802 MW has been developed representing only 9.9 % of the total potential. Moreover, the latest list of hydro-electric stations in India above 3 MW shows that there is no reference of any private party hydroelectric station in the state of Uttaranchal. The existing hydro-electric stations are being operated by the state body – Uttaranchal Jal Vidyut Nigam (UJVNL). There clearly indicates that carrying out a project similar to the BHPP as an Independent Power Producer (IPP) is not a common practice as of date. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | <input checked="" type="checkbox"/> step passed <input type="checkbox"/> step not passed <input type="checkbox"/> not applicable |

| Step1) | Argument PP | Assessment of the validation team | |
|--|--|---|--|
| 5 | The impact of CDM registration of the BHPP would be very much beneficial and multi-fold. It would help in overcoming the barriers identified as above. SPEL has taken the initiative to develop the BHPP as a CDM project and pave the way for others also to follow suit. The financial incentive due to CDM revenues would attract more parties for the development of the identified SHP existing in the region. There is tremendous potential of generating clean power by the development of SHP potential identified. All these potential sites are usually in the hilly regions and thereby posing similar barriers as mentioned above. Thus CDM registration would give a boost towards the development of these projects and help in the reduction of anthropogenic greenhouse gas. | <input type="checkbox"/> Argument not justified <input type="checkbox"/> Argument not convincing <input type="checkbox"/> Argument justified but not decisive <input checked="" type="checkbox"/> Argument justified / significant | <input checked="" type="checkbox"/> step passed <input type="checkbox"/> step not passed <input type="checkbox"/> not applicable |
| Assessment of the validation team | | <input checked="" type="checkbox"/> project is additional <input type="checkbox"/> project is not additional | |

The additionality of the project has been demonstrated by the “Barrier Analysis” route. Various investment associated risks like hydro-geological; environmental; implementation; transmission are elaborated with arguments of reality. These risks, in particular hydro-geological risks associated with project location, enhanced the cost of financing of the project.

The investment barrier is proven as the project activity is essentially family promoted company. The cost of financing the project activity also included the enhanced costs^{/IM01/,/BLS/} associated with hydro-geological risks associated with the project location.

Other barriers related to limited operating experience of this type of state-of-the-art technology based hydro electric power plant and unclear policies of Govt. of Uttaranchal at the time of project conceptualisation.

As per the latest officially available information^{/imnce/}, only 7.06% of the identified SHP potential (< 25 MW) has been harnessed in high hydel potential states of Uttaranchal, Himachal Pradesh, Jammu & Kashmir and that too the sites are of less than 5 MW size if average is taken. Moreover, the latest list^{/ceal/} of hydro-electric stations in India above 3 MW shows that there is no reference of any private party hydroelectric station in the state of Uttaranchal. The existing hydro-electric stations are being operated by the state body – Uttaranchal Jal Vidyut Nigam (UJVNL). There

clearly indicates that carrying out a project similar to the BHPP as an Independent Power Producer (IPP) is not a common practice as of date.

According to the PDD the impact of CDM registration of the BHPP help in overcoming the barriers identified as above. The financial incentive due to CDM revenues would attract more independent parties for the development of the identified SHP existing in the region giving a boost towards the development of these small-scale hydro projects in remote terrain and help in the reduction of anthropogenic greenhouse gas.

Thus the validation team arrived at the opinion that the project activity can be assessed to be additional and is not a BAU case.

Nevertheless, the following CR was raised.

| Clarification Request B5: | |
|----------------------------------|--|
| CR | The statement in the section B.3. sub-step 4b “similar options as that of BHPP is not existent as of now” is not clear w.r.t the project capacity range. Justify the same w.r.t current officially available data. |
| CA: | Please refer to the attached document on the weblink (http://www.cea.nic.in/hydro/List%20of%20Hydroelectric%20Stations%20in%20the%20Country.htm) wherein the latest list (as on 30-04-2006) of hydro-electric stations in India above 3 MW has been stated. As given in the weblink, there is no reference of any private party hydroelectric station in the state of Uttaranchal. The existing hydro-electric stations are being operated by the state body – Uttaranchal Jal Vidyut Nigam (UJVNL). |
| Conclusion: | Checked in the web-link is OK. CR is closed. |

4.4 Crediting Period

The intended crediting period of the project is fixed 10 years (2007-08 to 2016-17). The starting date of the crediting period is 16/04/2007.

4.5 Monitoring Plan

The project applies the baseline methodology ACM0002, for grid-connected electricity generation from renewable sources.

This methodology stipulates that monitoring shall consist of metering the electricity generated by the renewable technology and exported to the grid. According to the monitoring plan of the PDD this requirement is fulfilled.

The procedure for calibration & maintenance of monitoring equipment are clearly mentioned as per QA/QC procedure of PDD.

The following CAR / CR were issued:

| Corrective Action Request D1: | |
|--------------------------------------|--|
| CAR | Some of the required parameters mentioned in ACM 0002 is missing in the monitoring plan (for example plant name, fuel quantity, emission factor coefficient etc for determination of simple OM & BM). |
| CA: | Please refer the revised PDD and the attached baseline excel sheets. The emission factor calculation has been done ex-ante, therefore the emission factor remains fixed for the fixed crediting period (10 years) which cannot be renewed. Hence, these parameters are not to be monitored and thus are not a part of the monitoring plan. |
| Conclusion: | The revised PDD addresses the same in correct way. |

| Clarification Request D1: | |
|----------------------------------|---|
| CR | The format of the table under D.2.1.3. Does not corresponds to ACM 0002. |
| CA: | The table format is as per the latest format prescribed for the PDD preparation (page 6). |
| Conclusion: | OK. |

4.6 Calculation of GHG Emissions

Methodologies for calculating emission reductions are documented. The project intends to reduce carbon dioxide (CO₂) emissions by generating electricity from a run-of-the river hydroelectric project, which would be exported to the Northern Grid, which predominately receives electricity out of fossil fuels like coal, natural gas, diesel, furnace oil, naphtha etc.

There are no GHG emissions arising from the project it being a hydroelectric project. The main emissions potentially giving rise to leakage in the context of hydro electric sector projects are emissions arising due to activities such as power plant construction. As per the methodology ACM0002, project participants do not need to consider these emission sources as leakage in applying this methodology. Therefore no emissions related to leakage have been considered in this project.

Nevertheless the following CAR/ CR were issued:

| Corrective Action Request E1: | |
|--------------------------------------|---|
| CAR | The length of the crediting period (2007 to 2016) presented in the tabular form in the section E & A does not correspond to the starting dates of crediting period and 10 years of crediting period (cp section C.2.2.1 & the excel calculation sheet). |
| CA: | The crediting period has been corrected. Please check the revised PDD and the baseline excel sheets. As fixed crediting period of 10 years has been opted for the project activity and the tentative crediting period start date is from 16 th April 2007 and thus the crediting years are not in terms of calendar years rather they are in the form of 12 month periods. |
| Conclusion: | The corrections made in the PDD is OK. |

| Clarification Request E1: | |
|---------------------------|--|
| CR | The coal consumption figure for Built Margin is mentioned in the "Emission Factor Sheet" as estimated. However, the same has been taken from CEA thermal performance review reports. |
| CA: | The editorial correction has been made in the baseline excel sheet. Please refer the revised baseline excel sheet. |
| Conclusion: | OK |

The calculations of the baseline emissions are documented in section E. and in Annexure 3 of PDD. For assessment please refer to section 4.3.

Acc. to the final PDD the project is expected to reduce emissions of **1,093,040 tCO_{2e}** over a 10 years crediting period.

4.7 Environmental Impacts

Social & environmental impacts of the project have been sufficiently addressed. No adverse environmental impacts as well as transboundary impacts have been envisaged from this project activity. However, the following CAR was issued:

| Corrective Action Request F1: | |
|--------------------------------------|---|
| CAR | <p>In the view of the comment received during hosting period, the section F.1. requires following corrections and elaborations: Details of the amount of total land to be taken for the project is required to be included.</p> <p>The statement “there is no negative impact on the environment due to the project activity” is incorrect w.r.t the inherent impacts of construction and operational phases of project activities.</p> <p>The statements in the section F.1 “ The scheme would help in conservation of forest by replacing the fire wood for cooking and heating purposes with electricity” and “With the availability of assured cost effective electricity, there is vast potential for the development of agro, horticultural and forest based industries” contradicts with section A.2 (it says that the power will be connected to the grid and exported to the Northern region) and the last para in section B.1.1 (it says the power will be exported to Punjab as per Power Purchase Agreement with Power Trading Corporation) and also compare stake holder comment number 4.</p> <p>The statement “the irrigation facilities currently dry up in the lean discharge months...” stated in the PDD should be addressed in the view of public hosting comment number 9.</p> |
| CA: | <p>The land requirement detail has been incorporated in the revised PDD.</p> <p>There are minimal negative impacts due to the project activity and the same have been incorporated in the revised PDD.</p> <p>The project activity would be connected to the sub-station and would improve the power availability situation as the Northern grid is facing severe shortage of power. The contradictory statements have been rectified and removed.</p> <p>The statement is based on the DPR-Vol-1, Section 12.3.5. The agreement with the concerned villages (dated 02-12-2005) provides for protecting the irrigation discharges into the concerned existing irrigation channels. Please refer to the attached document Memo/S.T. Phalenda/06 dated 04.05.2006.</p> |
| Conclusion: | <p>The revisions to section F.1 are OK. The referred documents provided have been verified: /FC/, /EIA/, /DPR/ and /LSC-1 & 4/.</p> <p>CAR is closed.</p> |

4.8 Comments by Local Stakeholders

Stakeholders have been directly asked to comment on the project through an open meeting among local stakeholders, project proponent (SPEL); local authorities held on site in December 2005.

A summary of the comments received and a note on how these concerns are addressed are included in the PDD.

The agreement upon corrective actions have been signed as a binding deed in-between the local stakeholders and SPEL.

The following CAR were issued:

| Corrective Action Request G1: | |
|-------------------------------|---|
| CAR | In the context of the local stakeholder consultation carried out in Dec'05, description and evidence stated (two paper advertisement dated 5/4/01 and 6/4/01 for 11 MW hydel project) in the section G1 of the PDD should be described in open and transparent manner (as per 22.5 MW project activity). |
| CA: | Corrections have been made in the revised PDD. The local stakeholder consultation in context of the project activity being 22.5 MW has been done and the supporting documents for the same have been provided. The NOC from the adjoining villages has been obtained. Please refer the attached NOC documents from the following villages: Village Phalenda – Meeting date 01-04-2003 Village Baheda – Meeting held on 31-08-2003 and the NOC letter received on 13-09-2003 Village Chawasera – dated 25-10-2004 Village Ransol – dated 20-12-2004 |
| Conclusion: | The supporting documents ^{/LSC-5/} is OK. |

| Corrective Action Request G1: | |
|-------------------------------|---|
| CAR | In the view of the comment received during hosting period, the section G.3. requires following corrections and elaborations in the context of land inundation mentioned in the PDD: “land inundation would not occur due to the BHPP”. |
| CA: | The PDD has been appropriately corrected. |
| Conclusion: | OK. |

5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the validation of CDM projects, TÜV NORD JI/CDM CP published the draft PDD on its website www.global-warming.de on 19 May 2006 and invited comments within 30 days, until 17 June 2006 by parties, stakeholders and UNFCCC accredited non-governmental organisations. Comments from one NGO (South Asia Network on Dams, Rivers & People having a link with UNFCCC admitted NGO International River Network) was received in this period and same was made available to public on the same website. The comments (in unedited form) from an Indian Party – Mr Himanshu Thakkar and the consideration/response of TÜV NORD JI/CDM CP are presented in the table below:

Comment by: Mr Himanshu Thakkar, South Asia Network on Dams, Rivers & People, Delhi, India

Inserted on: 2006-06-14

Subject: Comments about Bhilangana Hydro Power Project

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
|--|---|
| While (relatively) small hydro projects like the 22.5 MW BHPP are desirable if taken up in proper manner, the project taken up as present should not be validated for the following reasons. | |

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
|--|---|
| <p>1. The project developer (Swasti Power Engineering Ltd) has not done any satisfactory consultation with the people in the affected villages. The local people have not been given any of the project documents like the detailed project report, have not been given the full environment impact assessment or environment management plan in the language that they can understand. Nor have the people been told in full about the adverse impacts of the project. This is clear violation of the rights of the people and also violation of the CDM norms for consultation of the stakeholders and the local people. The claim made by the proponents in the CDM PDD in this regard (section G 1) is misleading. Till this is corrected, the project should not be validated.</p> <p>As a matter of fact, an intense agitation by the local people against the project has been going on for over two years, during which the local community people have also faced human right violations. We would be happy to provide material to substantiate this if required.</p> | <ul style="list-style-type: none"> - Host Government Approval ^{/HGA/} has been obtained by the project which clearly states that the project meets the sustainability requirements. - The project has undergone the prescribed environmental appraisal process by relevant statutory bodies and obtained all necessary environmental clearances ^{/EC/}. - In the process of obtaining environmental clearances, the detail project report and EIA & EMP are required to be shared with the local communities. - Moreover, the project proponent has carried out local stake holder consultation in open and transparent manner in accordance with CDM Modalities and Procedures. The two years ago local agitation has been resolved as evidenced through proof of local stakeholder consultation ^{/LSC/}. Interview by validation team ^{/IM01/, /IM02/, /IM03/} also confirm the above facts. - In the context of the above local stakeholder consultation carried out in Dec'05, description and evidence stated in the section G1 of the PDD should be appropriately revised (Cp CAR G1). |
| <p>2. Section G.1 should have given details of the amount of total land to be taken for the project, which has not been given.</p> | <ul style="list-style-type: none"> - Section G.1 is not appropriate place for addressing details of the amount of total land to be taken for the project. However, the same information has been requested for inclusion in section F.1 of the PDD (Cp CAR F1) |

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
|---|--|
| <p>3. The PDD repeatedly makes the most shockingly misleading statement (section F.1, page 27 of PDD) “there is no negative impact on the environment due to the project activity”. A project of this nature always causes significant negative impacts on the environment, including due to diversion of agricultural land, due to diversion of forest land, due to diversion of the Bhilangana (thus almost drying up of the stream even if we take into consideration the claim that project would release 0.25 cumecs discharge all the time, till the water return to the stream after tail end channel), blasting for the tunnels and diversion structure, addition of large number of outsiders to the area and the impacts thereof, the disposal of the muck created in the project activity, the laying of transmission lines & roads, noise and dust pollution during construction, increase of possibilities of soil erosion and land slides and so on. The project document should be honest on such impacts and should include management plan for such impacts.</p> | <p>The adverse impacts of the project are very minimal as it is a run-of the river hydroelectric project. The relevant clearances^{/EC/} pertaining to land acquisition, forest clearances etc. have been taken. Any hydroelectric project needs approval from the Ministry of Environment and Forests (MoEF) wherein the relevant environmental management plans (EMPs) pertaining to catchments area treatment, muck disposal, green belt development, restoration & rehabilitation etc. are to be stated. The same was verified by the validation team and found OK.</p> <p>In the view of the above the statement (section F.1, page 27 of PDD) “there is no negative impact on the environment due to the project activity” is incorrect. Accordingly CAR F1 has been raised.</p> |
| <p>4. The PDD contradicts itself as on the one hand it says that the power will be connected to the grid and exported to the Northern region (section A.2). In the last para in section B.1.1 (page 7) the PDD says the power will be exported to Punjab as per Power Purchase Agreement with Power Trading Corporation. (The PDD also justifies the need of the project in the name of power demand in the northern region.) On the other hand it claims (section F.1, page 27) that “With the availability of assured cost effective electricity, there is vast potential for the development of agro, horticultural and forest based industries”. Experience from other areas where such projects have been taken up so that such claims are unfounded as the grid connected power (that too mostly exported outside the state) does not benefit the local people.</p> | <p>This has been considered as CAR F1.</p> |

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
|---|---|
| <p>5. The PDD makes wrong statement in section A.4.3 that “only fossil fuel fired power stations would contribute to major part of the future capacity additions” in the Northern region in future, when in reality, a very large number of big hydro projects are planned and under construction in the Northern Indian region. Moreover, the figure of energy shortage of 10.06% in 2004-5 is wrong, as per the report of the Northern Region Load Dispatch Centre (www.nrldc.org), the shortage was 9.01%. The figure of growth rate in peak power of 11.39% given is also wrong. The correct way would be to look at the compound annual growth rate over the last decade, which figure is 4.7%.</p> | <p>The statement “only fossil fuel fired power stations would contribute to major part of the future capacity additions” appears nowhere in the PDD. Hence the comment is out of context.</p> <p>Other figures like 10.06% energy shortage, peak power 11.39 % are not quoted in the PDD. Hence the comment is out of context.</p> |
| <p>6. Power generation data from small hydro projects in Uttaranchal shows (e.g. in the PDD of the Kaliganga small hydro in Uttaranchal, which was put up for validation during May 5 to June 4, 2006) that the Plant load factor of such projects is 20.7% generally. If that is the case how are the proponents claiming that for the proposed BHPP, the PLF would be 66.26% when it claims in section A.2 that “The project will produce around 130.59 GWh of electricity”?</p> | <p>This aspect already covered under pre-validation process and resulted in CR A1.</p> |
| <p>7. The analysis and the conclusion there from on page 8-13 in section B.3 that project is additional is misleading and incorrect for the following reasons.</p> <p>7a It would not be right to claim that step 0 does not apply to BHPP activity.</p> | <p>According to the Additionality Tool Ver 02 Step 0 is applicable when retrospective carbon credits are being claimed. Hence the argument in the PDD is correct.</p> |
| <p>7b. The alternatives listed in step 1a does not include some of the most important viable alternatives: Increase the output from existing plants, reduce transmission and distribution losses, increase end use efficiencies, reduce theft of power, other generation options including smaller hydro, biomass, solar, etc. Due to non-inclusion of these important and viable alternatives, the exercise of proving the project as additional remains suspect.</p> | <p>This comment related to inclusion of alternatives is irrelevant in the context of the additional tool version 02 sub step 1a. requiring realistic and credible alternative(s) available to the project participant. Instead the section B.3 of PDD considers one realistic and credible alternative, ie, “continuation of the current situation in the northern grid with no project activity” with a justified elimination of four other options.</p> |

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
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| <p>7c Rejection of Alternative on the grounds that the project cannot be taken up without the CDM credits is not correct as the project activities started before the CDM registration process started. As mentioned in point (f) on page 11, the project was allotted to the developer (on developer having expressed interest in the project) by the Uttar Pradesh govt before 2001.</p> | <p>Rights to site development were allotted by the Govt of Uttar Pradesh, before 2001 and subsequently recognised by the Government of Uttaranchal. However, real project activity started on 16/10/2003 ^{/SD/} with the consideration of CDM requirements. Due to the barriers as explained in the section B.3 of the PDD the project would not have realised. Hence the comment is in-appropriate.</p> |
| <p>7d The claim made (page 11) "The people who were affected by the Tehri dam have been given heavy monetary compensation" leading to "increased expectations and greed" is utterly wrong and misleading. As a matter of fact the struggle of the people affected by the Tehri dam to get just & proper rehabilitation as per the promised policies and provisions have been long and well known, which is not yet over. To say that they have been given "heavy monetary compensation" is totally wrong. To insinuate that people affected by such projects are driven by greed, that too when it comes from the developer of the project, is total travesty of justice and truth. The situation is exactly opposite, most developers in their greed to cut corners and reduce expenses, do injustice to the affected people.</p> | <p>This has been considered as CAR B3.</p> |
| <p>7e Moreover, there is a separate ministry for non conventional sources of energy, at whose website (www.mnes.nic.in) one can see the slew of incentives provided for small hydro projects. By not mentioning these, the proponents are trying to mislead the CDM process.</p> | <p>The additionally argument presented in the PDD in section B.3 is based on barrier route. Hence the consideration of MNES incentives is out of context.</p> |

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
|--|--|
| <p>7f The figure of existing hydropower capacity in India at 27 000 MW given in step 4 is quite outdated. The existing capacity as on March 31, 2006 is over 32200 MW as per Ministry of Power, Govt of India, see the website: www.powermin.nic.in. Similarly the current figure for small hydro installed capacity as on Dec 31, 2005 is 1747.98 MW and those under implementation is at 585.13 MW (annual report of MNES for 2005-6). Thus the claim on page 13 that “similar options as that of BHPP is not existent as of now” is totally wrong. A number of projects in comparable range are coming up in Northern India.</p> | <p>This has been considered as CAR B4 and CR B5.</p> |
| <p>8. The baseline emission rate of 916 T / million units generated (section E.4) is much higher than what should be the figure. For example, the rate for the emission from the recently commissioned 20% of the existing capacity in the Northern Region comes to 720 T / MU, way below the assumption of 916 T / MU. Similarly, for Kaldigad, Kaliganga and madhyamaheshwar small hydro in Uttaranchal that came up for validation recently, the emission factor assumed is 839.87 T/ MU, way below the figure assumed for BHPP. If the project were to consider the project mix in Uttaranchal or Punjab (where the power from the project is expected to go), than the emission rate would be even lower.</p> | <p>Validation team has made independent assessment of the grid emission factor spread sheet ^{/XCS/} based on ACM 0002 (simple OM and 20 % build margin route) and found some inadequacies (Cp CAR B2, CAR D1, CR B1, CR B2, CR B4, CR E1).</p> <p>As per EB guidelines the regional grid is to be taken as the baseline electricity system boundary, in this case Northern regional electricity grid applies.</p> |
| <p>9. The statement in section F.1 that “the irrigation facilities currently dry up in the lean discharge months...” gives a wrong picture. In reality the project is going to significantly alter the releases in the Bhilangana stream and impact both the irrigation water availability in the downstream areas and also the fisheries and other biodiversity in the stream. There is no mention of the full assessment of these impacts in the PDDs, and on the contrary an attempt has been made to give a contrary picture.</p> | <p>The agreement ^{/LSC/} with the concerned villages provides for protecting the irrigation discharges into the concerned existing irrigation channels.</p> <p>The statement “the irrigation facilities currently dry up in the lean discharge months...” stated in the PDD should be addressed in the view of this comment. This is addressed under CAR F1.</p> |

| Comment: | Consideration / response of TÜV NORD JI/CDM CP |
|--|--|
| <p>10. The claim in section G.2 that there is no requirement for NOC (No objection certificate) from the state pollution control board is completely wrong as NOC is required not just from the SPCB, but also from each of the panchayat in the project area.</p> | <p>No requirement of NOC (dated 25.05.05) from SPCB have been verified ^{/EC/} and found correct.</p> <p>Validation team has verified the agreement ^{/LSC/} with the concerned villagers provides for protecting the irrigation discharges into the concerned existing irrigation channels and land. Hence the same was found satisfactory.</p> |
| <p>11. The objectives of “open forum” stated in Section G.1 that the project is for it is to ensure project sustainability and help stakeholders contribute to the project is also incorrect. The objective of the public hearing process is supposed to be to get people’s views about the project’s acceptability, among other aspects and the public hearing process is supposed to be part of the decision making process.</p> | <p>See the response against comment number 1 and CAR G1.</p> |
| <p>12. The statement on page 30 of the PDD that “land inundation would not occur due to the BHPP” is not correct. Some inundation of the land at the diversion dam and also in the path of the tunnel/ channel / tail race canal.</p> | <p>The statement “land inundation would not occur due to the BHPP” in the section G.3 of the PDD is incorrect. Hence, CAR G2 has been raised.</p> |

6 VALIDATION OPINION

The Swasti Power Engineering Private Ltd., has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: “22.5 MW Bhilanhana Hydro Power Project (BHPP)”, with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), and the relevant decisions by COP/MOP and CDM Executive Board.

The run-of-the river hydroelectric project intends to reduce GHG emissions to the extent of electricity displaced from the northern regional grid of India.

A risk-based approach has been followed to perform this validation. In the course of the draft validation 9 Corrective Action Requests (CARs) and 8 Clarification Requests (CRs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval has been obtained from National CDM Authority as DNA of India vide the Letter of Approval (HGA) dt 03 March 2006.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 1,093,040 t CO_{2e} is most likely to be achieved within the 10 years (fixed) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Essen, 2006-10-22



Rainer Winter

TÜV NORD JI/CDM Certification Program

7 REFERENCES

Table 7-1: Documents provided by the project proponent

| Reference | Document |
|--------------|---|
| /AFP/ | Compensatory afforestation payments made to District Forest Officer, Tehri Forest Division |
| /BLS/ | A) Financial Appraisal report developed by SBI Capital Markets Ltd, Mumbai, dated September 2004 B) Sanction of Term loan from <ol style="list-style-type: none"> 1. State Bank of Hyderabad, dated 14-05-2005 2. Andhra Bank, dated 4-03-2005 3. Indian Bank, dated 1-06-2005 4. Allahabad Bank, dated 6-05-2005 |
| /DOA/ | Deed of agreement with M/s IVRCL Infrastructures & Projects Ltd for execution of Civil & Hydro-mechanical construction works of the project, dated 2-07-2005 |
| /DPR/ | Detail Project Report (Vol- I & Vol- II), developed by Dr. Hutarew & Partner (I) Pvt. Ltd., dated April 2004 |
| /EC/ | <ol style="list-style-type: none"> 1. Environmental clearance to the project, dated 23-06-2004 from Ministry of Environment & Forests, Government of India 2. No objection certificate from Pollution Control Board, dated 25-05-2005 Ministry of Environment & Forests, Government of India. |
| /EIA/ | Environmental Impact assessment for Bhilangana H.E. project, Uttarakhand, conducted by Centre for Inter-Disciplinary Studies of Mountain & Hill Environment, New Delhi. |
| /FC/ | <ol style="list-style-type: none"> 1. 30 year lease letter from Uttarakhand Forest department, dated 04-August 2004 2. 30 year lease letter from Uttarakhand Forest department, dated 03-June 2005 3. 30 year lease letter from Uttarakhand Forest department, dated 01-June 2005 |
| /HGA/ | Host Government Approval: Ministry of Environment & Forests, Government of India, dated 3 March 2006 |
| /LSC/ | Proof of local stakeholder consultation <ol style="list-style-type: none"> 1. Minutes of meeting in local language (Hindi) carried on 2-12-2005. The copy has been signed by the villagers representative, Local Govt representative and SPEL. Translated copy attached. 2. Agreement dated 26-12-2005, signed in-between SPEL and Village- |

| Reference | Document |
|--------------|---|
| | <p>Roansal & Village Panchayat Roansal. Translated copy attached.</p> <p>3. Agreement dated 17-11-2004, signed in-between SPEL and Village Panchayat- Baheda, Patti Nailchami, Vikas Khand Bhilangana. Translated copy attached.</p> <p>4. Minutes of meeting in local language (Hindi) carried on 4-05-2006. The copy has been signed by the villagers representative, Local Govt representative and SPEL. Translated copy attached.</p> <p>5. NOC from villages Phalenda (date: 01-04-2003), Baheda (date: 31-08-2003), Chawasera (date: 25-10-2004) and Roansal (date: 20-12-2004)</p> <p>6. Minutes of meeting in local language (Hindi) carried on 12-04-2004. The copy has been signed by the villagers representative, Local Govt representative and SPEL.</p> |
| /MOC/ | Modalities of communicating with the CDM EB & the UNFCCC Secretariat, issued on 27 Sep'06. |
| /PDD/ | <p>1. Project Design Document entitled "22.5 MW Bhilangana Hydro Power Project (BHPP)" (hosted for public comments during 19/05/06 to 17/06/06)</p> <p>2. Final PDD: "22.5 MW Bhilangana Hydro Power Project (BHPP)" (Corrected and submitted by Project Proponent in September 06)</p> |
| /PHT/ | Photographs of progress of construction activity at the project site |
| /PO/ | Contract between Swasti Power engineering & VA Tech Escher Wyss Flovel Ltd for supply of electro-mechanical equipment, dated 20 th September 2005 |
| /PPA/ | Power purchase agreement between PTC India Ltd and Swasti Power Engineering Ltd dated 24 August 2005. |
| /SD/ | Proof for project activity starting date – Implementation agreement in-between UJVNL and SPEL for BHPP project and payment of project premium to Uttaranchal Govt, dated 16.10.2003. |
| /XCS/ | Supporting Excel calculation sheets Baseline & emission reduction |

Table7-2: Background investigation and assessment documents

| Reference | Document |
|------------------|--|
| /ACM0002/ | Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 06: 19 May 2006) |
| /CPM/ | TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms) |

| Reference | Document |
|-----------|---|
| /GCP/ | UNFCCC: Guidelines for completing CDM-PDD and CDM-NM (Version 05) |
| /GEF/ | Official data sources for Grid Emission Factor (Northern Regional Grid , 04-05) |
| /IPCC-GP/ | IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 |
| /IPPC-RM/ | Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual |
| | IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 |
| /KP/ | Kyoto Protocol (1997) |
| /MNES/ | Baseline Guidelines |
| /MA/ | Decision 17/CP. 7 (Marrakesh – Accords & Annex to decision 17/CP.7) |
| /NATCOM/ | National Communication to UNFCCC (Chapter 2 on NCV value) |
| /NRP/ | New & Renewable Energy Policy statement 2005: Draft II |
| /TA/ | Tool for the demonstration and assessment of additionality (Ver 2). |
| /VVM/ | IETA, PCF Validation and Verification Manual (V. 4) |

Table 7-3: Websites used

| Reference | Link | Organisation |
|-----------|--|--|
| /ceal/ | www.cea.nic.in | Central Electricity Authority |
| /dna-il/ | www.envfor.nic.in/cdm | The National Clean Development Mechanism (CDM) Authority |
| /imef/ | www.envfor.nic.in | Indian Ministry of Environment and Forest |
| /imnce/ | www.mnes.nic.in | Ministry of Non-conventional Energy Sources |

| Reference | Link | Organisation |
|-----------|--|--|
| /imp/ | www.powermin.nic.in | Indian Ministry of Power |
| /infra/ | www.infraline.com | On-line subscription service on energy sector information and database |
| /ipcc/ | www.ipcc-nggip.iges.or.jp | IPCC publications |
| /irn/ | www.irn.org | International Rivers Network |
| /nreb/ | www.nreb.nic.in | Northern Regional Electricity Board of India |
| /nrlcdc/ | www.nrlcdc.org | Northern Region Load Dispatch Centre of India |
| /san/ | www.narmada.org/sandrp | South Asia Network on Dams, Rivers & People |
| /ujvnl/ | www.uttaranchaljalvidyut.com | Uttaranchal Jal Vidyut Nigam Limited |
| /unfccc/ | http://cdm.unfccc.int | UNFCCC |

Table 7-4: List of interviewed persons

| Reference | Mol ¹ | | Name | Organisation / Function |
|-----------|------------------|---|-------------------------------|--|
| /IM01/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms | Mr. Y. S. Raveendranath Reddy | Managing Director, SPEL |
| /IM01/ | T | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Sumer Singh | Director and Site Incharge, SPEL |
| /IM01/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Priya Darshan | Administrative Secretary, SPEL |
| /IM02/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Rajesh Miglani | Manager, Ernst & Young Ltd |
| /IM02/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Sandeep Kanda | Consultant, Ernst & Young Ltd |
| /IM03/ | T | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Dev Chand Ramola | President, Bhilangana Ghati Bandh Nijakaran Virodhi Sanghatan, Distt Tehri Garhwal |

| Reference | Mol ¹ | | Name | Organisation / Function |
|-----------|------------------|---|-----------------------|---|
| /IM03/ | T | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Hira Lal | Local Citizen, Tehri Garhwal |
| /IM04/ | T | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. S C Pandey | SDM, Ghansali, Distt Tehri Garhwal |
| /IM04/ | T | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Govind Badoni | Village Pradhan, Ghansali, Chauras Shera Village, Distt Tehri Garhwal |
| /IM04/ | T | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Mr. Ram Ghayal Chemal | Village Pradhan, Behada, Distt Tehri Garhwal |

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)

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ANNEX

Validation Protocol

ANNEX : VALIDATION PROTOCOL

Table 1: Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|----------------------------|---|
| 1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3 | Kyoto Protocol Art.12.2 | OK (Unilateral project) | Table 2, Section E.4.1 Annex 1 party will be identified in due time. The post registration involvement by Annex I party will be as per provisions (decision no 57) made in 18 th EB meeting. |
| 2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof | Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a | OK | Table 2, Section A.3 |
| 3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC | Kyoto Protocol Art.12.2. | CARE1 | Table 2, Section E.4.1 |
| 4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved | Kyoto Protocol Art. 12.5a, Marrakech Accords, CDM Modalities §40a | OK | In the LoA dt 03 March'06, the Indian DNA, National CDM Authority under Ministry of Environment & Forests confirmed the voluntary participation in the proposed CDM project activity. As it is a unilateral project, there is no written approval of |



| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|--|--|---|--|
| | | | an annex I country. |
| 5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change | Kyoto Protocol Art. 12.5b | CAR E1 | Table 2, Section E.4.1 |
| 6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity | Kyoto Protocol Art. 12.5c, Marrakech Accords, CDM Modalities §43 | CAR B1-B4 CR B1-B2 | Table 2, Section B.2. |
| 7. Potential public funding for the project from Parties in Annex I is not a diversion of official development assistance | Marrakech Accords | OK | The funding of the project will not involve ODA as stated under A.4.5. of PDD |
| 8. Parties participating in the CDM shall designate a national authority for the CDM | Marrakech Accords, CDM Modalities §29 | OK | The Indian DNA is National CDM Authority under Ministry of Environment & Forests. Annex 1 party will be identified before project registration, if required. Accordingly DNA of Annex 1 party will be made available. |
| 9. The host country is a Party to the Kyoto Protocol | Marrakech Accords, CDM Modalities §30 | OK | India is a Party to the Kyoto Protocol and has ratified the Protocol on 26 Aug 2002. |
| 10. Comments by local stakeholders are invited, a summary of these provided and how due account was taken of any | Marrakech Accords, CDM Modalities | CAR G1 | Table 2, Section G |



| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|---|--|
| comments received | §37b | | |
| 11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, has been submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party has been carried out. | Marrakech Accords, CDM Modalities §37c | OK | Table 2, Section F |
| 12. Baseline and monitoring methodology is previously approved by the CDM Methodology Panel | Marrakech Accords, CDM Modalities §37e | OK | Table 2, Section B.1.1 and D.1.1 Approved methodology ACM0002 is used |
| 13. Provisions for monitoring, verification and reporting are in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP | Marrakech Accords, CDM Modalities §37f | CAR-D1 CR-D1 | Table 2, Section D |
| 14. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available | Marrakech Accords, CDM Modalities, §40 | OK | The PDD was made available for public commenting on www.global-warming.de from 19 May 2006 for 30 days. Until the end of the stakeholder commenting process, 17 June 2006, one comment has been received. |
| 15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances | Marrakech Accords, CDM Modalities, §45c,d | CAR-B1-B4 CR-B1-B2 | Table 2, Section B.2 |
| 16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure | Marrakech Accords, CDM Modalities, §47 | OK | Table 2, Section B.2 |

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| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|--|--|------------|---|
| 17. The project design document is in conformance with the UNFCCC CDM-PDD format | Marrakech Accords, CDM Modalities, Appendix B, EB Decisions | OK | The PDD is in conformance with version 02 of the CDM-PDD. |

Table 2: Requirements Checklist

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|--------------------------|-------|--|-----------------|-----------------|
| A. General Description of Project Activity <i>The project design is assessed.</i> | | | | | |
| A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i> | | | | | |
| A.1.1. Are the project's spatial (geographical) boundaries clearly defined? | /PDD/ (A.4) | DR | The project activity is located a few kilometres North of Ghansali township (Longitude 78°34'30", Latitude 30°25'41") in the state of Uttaranchal. The project site is about 45 kilometres from the origin of River Bhilangana. | OK | |
| A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined? | /PDD/ (B.4) /IM01/ | DR, I | The system boundaries of the project are clearly defined. All operations, activities, physical sites and facilities involved in net displacement of grid electricity are included in the project boundary. The special extent of the project boundary includes the project site and all power plants connected physically to the electricity system that this CDM project power plant is connected to. | OK | |

* MoV = Means of Verification, DR= Document Review, I= Interview

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--|--|-------|---|--------------|--------------|
| A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i> | | | | | |
| A.2.1. Does the project design engineering reflect current good practices? | /PDD/ (A.4.3. , Section F) /cea/ /IM01/ /EC/ /DPR/ | DR, I | <p>Yes, the hydropower project intends to incorporate the latest/state-of-the-art technologies as given by the Central Electricity Authority. The generation technology employs technologies like digital turbine governors for speed regulation of hydro turbines; fully computerised control system; gas insulated switchgear. Other environmental protection aspects have been considered as per the environmental clearance obtained from Ministry of Environment & Forests, Govt. of India.</p> <p>Feasibility study on appropriateness of the employed technology and hydro geological study has been undertaken before project design stage.</p> <p>The figure of estimated net electricity supply, i.e., 130.59 GWh in the PDD does not match with the figure in the Detail Project Report (Vol-I, page</p> | CR A1 | OK |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|--------------------------------------|------|--|-----------------|-----------------|
| | | | 21/166), i.e., 121.956 GWh. Clarification is requested. The basis of the estimated figure requires to be justified. | | |
| A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country? | /PDD/ (A.4.3.) /IM01/ /cea/ | DR,I | This hydropower project intends to incorporate the latest/state-of-the-art technologies as given by the Central Electricity Authority. | OK | |
| A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period? | /PDD/ (A.2.) /IM01/ | DR,I | No, not likely to be substituted. | OK | |
| A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? | /PDD/ (D.4) /IM01/ | DR,I | Based on validation team experience, the initial training is required because of the limited experience available for this type of project. For sustainable operation professional staff for procurement, quality check of monitored data; and maintenance of critical equipments are needed to be employed. | OK | |
| A.2.5. Does the project make provisions for meeting training and maintenance needs? | /IM01/ | I | Training and maintenance system related to this technology is verified during interview. | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i> | | | | | |
| A.3.1. Is the project in line with relevant legislation and plans in the host country? | /PDD/ (F.1.) /EC/ | DR | The project is holding the necessary operating license and is in line with relevant legislation. Environmental Clearance has obtained based on rapid EIA carried out. No Objection certificate from office of the pollution control board has been obtained. | OK | |
| A.3.2. Is the project in line with host-country specific CDM requirements? | /PDD/ (A.2.) /HGA/ | DR | Yes, the project is in line with National CDM Authority under Ministry of Environment & Forests (MoEF) as a DNA of Government of India (Host Country). Project proponent has obtained the approval from MoEF as per the letter of approval (LoA) dt 03 Mar'06 | OK | |
| A.3.3. Is the project in line with sustainable development policies of the host country? | /HGA/ | DR | In its LoA dt 03 Mar'06, the Indian DNA confirmed that the project contributes to sustainable development in India. | OK | |
| A.3.4. Will the project create other environmental or social benefits than GHG emission reductions? | /PDD/ (A.2) /ECL/ | DR, I | Yes, according to EIA study carried out, the project is expected to have positive effects on the employment situation and the socio-economic well | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | being. Apart from GHG emission reduction, a perennial supply of water for irrigation, contribution to meet the gap between electricity supply & demand of northern grid will be achieved compared to prevailing coal based electrical power generation. | | |
| B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i> | | | | | |
| B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i> | | | | | |
| B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel? | /PDD/ (B.1.) /ACM0002/ | DR | Yes, the project applies baseline methodology ACM 0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources. | OK | |
| B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified? | /PDD1/ (B.1.1.) /IM01/ | DR,I | The baseline methodology is applicable to run-of-river hydro power project where: <ul style="list-style-type: none"> • It is electricity capacity addition to the grid; • It does not involve switching | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | <p>from fossil fuels to renewable energy at the site of the project activity; and</p> <ul style="list-style-type: none"> The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available. | | |
| B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i> | | | | | |
| B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent? | /PDD/ (B.1, B.2.) /IM02/ | DR,I | <p>The version number of ACM 0002 mentioned in the section B & D of the PDD is not current, ie, version 06.</p> <p>The official data sources for power generation mix of northern region for 00-01 & 01-02 years in Annex 3 of the PDD are not mentioned.</p> | CAR B1 CR B1 | OK OK |
| B.2.2. Has the baseline been determined using conservative assumptions where possible? | /PDD/ (D.2.1.4. , Annex3) | DR | The baseline under adopted methodology ACM 0002 is the combined margin (04-05) of northern regional grid and determined based | | |



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| | /XCS/ /MNES/ /NATCOM/ | | <p>on weighted average of the simple operating margin (ex-ante: 3 years average) and the build margin (20 % of 04-05 generation from most recent plants).</p> <p>The imports from the connected electricity system is not accounted for the simple operating margin (cp D.2.1.4 of the PDD & the excel calculation sheet)</p> <p>ACM 0002 requires using local values of NCV and CO₂ emission factor, where available. If no such values are available, country specific values (see e.g. IPCC Good Practice Guidance) are preferred to IPCC world-wide default values. The use of NCV value of coal (4593 kcal/kg) from NATCOM Report (containing 1994 data) is not justified in the context of local; national as well as current compared to India specific values published by Central Electricity Authority (Cp General Review Report 2006, 2005, 2004 – chapter 6).</p> | CR B2 CR B3 | OK OK |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| B.2.3. Has the baseline been established on a project-specific basis? | /PDD/ (Annex 3) | DR | The baseline scenario is established considering the specific circumstances of this project and the selection of grid boundary of the project electricity system is also appropriate, ie, northern regional grid of India. | OK | |
| B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | /PDD/ (A.4.4.) | DR,I | Yes, relevant national and sectoral policies (the Indian Electricity Act 2003, the Draft National Electricity Policy 2004) have been taken into account. This project is also in line with Non Conventional Energy Policies. This is also in line with the objective Government of India to contribute 10% of incremental capacity by renewable sources. | OK | |
| B.2.5. Is the baseline determination compatible with the available data? | /PDD/ (Annex 3) /GEF/ /XCS/ | DR | The baseline emission estimation is supported by available data. Validation team made an independent assessment on the calculation and the authenticity of the data sources to arrive the resultant baseline emission figure mentioned in the PDD. The values of the 'total low cost power generation' for the years 2002-03, | OK CAR B2 | OK |



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| | | | <p>2003-04, 2004-05 in Annex-3 is incorrect and the data vintage should be updated for the recent available official data source, ie, for the year 2005-06.</p> <p>The coal generation figure, ie, 240570.42MU in the 02-03 generation sheet does not match with Emission Factor sheet, ie, 98724.42 MU. The similar mismatch of 04-05 gas generation figures (14362.83 vs 19890.00). This is based on sample check.</p> | CR B4 | OK |
| B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios? | /PDD/ /ACM0002/ /IM02/ | DR, I | <p>The baseline is in line with methodology ACM0002. The selected combined margin approach is appropriate. The base line scenario is GHG emissions from fossil fuel dominated power plants feeding the Northern Regional Grid of India.</p> <p>This was also verified during interview.</p> | OK | |
| B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through demonstrating investment barriers, | /PDD/ /B.3/ /IM 01/ | DR,I | <p>This project is not a baseline scenario. This is demonstrated by barrier route as per the UNFCCC "Tool for the demonstration and assessment of</p> | | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| technology barriers, barriers to prevailing practices, and/or other barriers or through quantitative evidence that the project would otherwise not be implemented)? | /IM 03/ | | additionally“. | | |
| | | | The references of the Tehri Dam are in-appropriate for this run of river project activity and the section B.3 should be appropriately corrected. | CAR B3 | OK |
| | | | The figure of existing hydropower capacity in India at 27 000 MW stated in step 4 of section B.3 of the PDD is outdated (Cp. www.powermin.nic.in). Moreover, the values for installed hydropower in Uttaranchal (Page 10 and 11 of the PDD), ie, 954.15 MW contradicts with the values in page 13 ,ie, 1478.24 MW. The “Monthly reports (March 2006)” of the CEA show for Uttaranchal: 978 MW (State Sector) and additional 400 MW (Central Sector / NHPC) – and the Theri Powerstation with 0 MW because it don’t work – so the capacity is much more than 954.15 MW total installed hydropower in Uttaranchal. | CAR B4 | OK |
| | | | The statement in the section B.3. Sub-step 4b “similar options as that of | CR B5 | OK |



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| | | | BHPP is not existent as of now" is not clear w.r.t the project capacity range. Justify the same w.r.t current officially available data. | | |
| B.2.8. Have the major risks to the baseline been identified? | /PDD/ /IM01/ | DR,I | Under investment barriers argument Hydrological Risks, Geological Risks, Environmental Risks, Implementation Risks, Transmission Risks have been addressed. | OK | |
| B.2.9. Is all literature and sources clearly referenced? | /PDD/ (Annex– 3) | DR | The baseline sections of PDD are supported by official data sources in the table of Annex 3 of the PDD. See comment under B.2.1 and CR B1. | CR B1 | OK |
| C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i> | | | | | |
| C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable? | /PDD/ (C.1.1) /SD/ /IM01/ | DR,I | The starting date of the project activity is 16/10/2003 as per the proof furnished to validation team. | OK | |
| C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable | /PDD/ | DR | A fixed crediting period of 10 years is | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| crediting period of max. two x 7 years or fixed crediting period of max. 10 years)? | (C.2.2.2.) | | adopted | | |
| D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i> | | | | | |
| D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i> | | | | | |
| D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel? | /PDD/ (D.1.) | DR | Yes, the project applies approved monitoring methodology ACM 0002. | OK | |
| D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified? | /PDD/ (D.2.) | DR | Yes, the application of ACM0002 is justified. | OK | |
| D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices? | /PDD/ (Sec D.) | DR | Yes, the monitoring plan with QA/QC procedure based on ACM0002 shows conservative calculations of emission reduction. | OK | |
| D.1.4. Is the discussion and selection of the monitoring methodology transparent? | /PDD/ (D.2.) | DR | The Monitoring Plan presents the monitoring and reporting of the main project components in a clear & transparent manner. | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i> | | | | | |
| D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period? | /PDD/ (D.2.1.1/2) | DR | No project emission | OK | |
| D.2.2. Are the choices of project GHG indicators reasonable? | /PDD/ (D.2.1.1/2) | DR | See comment made under D.2.1. | OK | |
| D.2.3. Will it be possible to monitor / measure the specified project GHG indicators? | /PDD/ (D.2.1.1/2) | DR | See comment made under D.2.1. | OK | |
| D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions? | /PDD/ (D.2.1.1/2) | DR | See comment made under D.2.1. | OK | |
| D.2.5. Will the indicators enable comparison of project data and performance over time? | /PDD/ (D.2.1.1/2) | DR | See comment made under D.2.1. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i> | | | | | |
| D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage? | /PDD/ (D.2.3.) /ACM 0002/ | DR | No leakage applies. | OK | |
| D.3.2. Have relevant indicators for GHG leakage been included? | /PDD/ (D.2.3.) /ACM 0002/ | DR | See comment made under D.3.1. | OK | |
| D.3.3. Will it be possible to monitor the specified GHG leakage indicators? | /PDD/ (D.2.3.1) /AM 0004/ | DR | See comment made under D.3.1. | OK | |
| D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i> | | | | | |
| D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period? | /PDD/ (D.2.1.3.) | DR | Some of the required parameters mentioned in ACM0002 are missing in the monitoring plan (for example plant name, fuel quantity, emission factor coefficient etc for determination of simple OM & BM) The format of the table under D.2.1.3. | CAR D1 CR D1 | OK OK |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | does not corresponds to ACM 0002. | | |
| D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable? | /PDD/ (D.2.1.4.) /IM 02/ | DR,I | A monitoring of baseline emissions is limited to amount of electricity supplied to the grid, grid CO ₂ emission factor according to ACM 0002. | OK | |
| D.4.3. Will it be possible to monitor the specified baseline indicators? | /PDD1/ (D.1.1.3.) | DR | Yes the comments made under D.4.2. | CR D1 | |
| D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i> | | | | | |
| D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts? | /EIA/ /EC/ /IM01/ | DR,I | Yes, the sustainable development related monitoring is being followed by SPEL as per comprehensive Environmental Management Plan under Environmental Impact Assessment Study. | OK | |
| D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable? | /EIA/ /EC/ /IM01/ | DR,I | Yes, reasonable | OK | |
| D.5.3. Will it be possible to monitor the | /EIA/ | DR | EMP specifies monitoring of | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| specified sustainable development indicators? | /EC/ /IM01/ | | sustainable development indicators. | | |
| D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country? | /PDD/ /HGA/ | DR | Specified sustainable development indicators are verified against stated national priorities of India. However, in its LoA dt 03March'06, the Indian DNA confirmed that the project contributes to sustainable development in India. | OK | |
| D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i> | | | | | |
| D.6.1. Is the authority and responsibility of project management clearly described? | /PDD/ (D.4) /IM01/ | DR, I | Yes, project will be implemented by SPEL. Responsibility of project management is briefly described in PDD. | OK | |
| D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described? | /PDD/ (D.4) /IM01/ | DR,I | Yes | OK | |
| D.6.3. Are procedures identified for training of monitoring personnel? | /PDD/ (D.4) /IM01/ | DR,I | PDD addresses the qualified staff SPEL at site. This is also confirmed during interview. | OK | |



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| D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions? | /IM01/ | I | The emergency preparedness would be implemented. This is also confirmed during interview. | OK | |
| D.6.5. Are procedures identified for calibration of monitoring equipment? | /PDD/ (D.3.) | DR | Procedure for calibration of monitoring equipment is mentioned under QA/QC procedure of the PDD | OK | |
| D.6.6. Are procedures identified for maintenance of monitoring equipment and installations? | /PDD/ (Annex-4) D.3. | DR | Procedure for maintenance of monitoring equipment is mentioned under QA/QC procedure of the PDD | OK | |
| D.6.7. Are procedures identified for monitoring, measurements and reporting? | /PDD/ D.3. | DR | Yes | OK | |
| D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) | /PDD/ D.3. | DR | Yes | OK | |
| D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties? | /PDD/ D.3. | DR | Yes | OK | |
| D.6.10. Are procedures identified for review of reported results/data? | /PDD/ D.3. | DR | Yes | OK | |
| D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where | /IM01/ | I | Yes | OK | |



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| applicable? | | | | | |
| D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally? | /IM01/ | I | Yes | Ok | |
| D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting? | /IM01/ | I | Yes | Ok | |
| E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i> | | | | | |
| E.1. Predicted Project GHG Emissions <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i> | | | | | |
| E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design? | /PDD/ (Sec E.1) | DR | In the context of such run-of-river hydroelectric project emissions are zero. | OK | |
| E.1.2. Are the GHG calculations documented in a complete and transparent manner? | /PDD/ (Sec E.1) | DR | See the comment made in E.1.1. | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| E.1.3. Have conservative assumptions been used to calculate project GHG emissions? | /PDD/ (Sec E.1) | DR | See the comment made in E.1.1. | OK | |
| E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation? | /PDD/ (Sec E.1) | DR | See the comment made in E.1.1. | OK | |
| E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated? | /PDD/ (Sec E.1) | DR | See the comment made in E.1.1. | OK | |
| E.2. Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i> | | | | | |
| E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified? | /PDD/ (E.2.) | DRI | In the context of such run-of-river hydroelectric leakage is zero, as per ACM 0002. | OK | |
| E.2.2. Have these leakage effects been properly accounted for in calculations? | /PDD/ (E.2.) | DRI | In the context of such run-of-river hydroelectric leakage is zero, as per ACM 0002. | OK | |
| E.2.3. Does the methodology for calculating leakage comply with existing good | /PDD/ | DRI | In the context of such run-of-river hydroelectric leakage is zero, as per | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| practice? | (E.2.) | | ACM 0002. | | |
| E.2.4. Are the calculations documented in a complete and transparent manner? | /PDD/ (E.2.) | DRI | In the context of such run-of-river hydroelectric leakage is zero, as per ACM 0002. | OK | |
| E.2.5. Have conservative assumptions been used when calculating leakage? | /PDD/ (E.2.) | DRI | In the context of such run-of-river hydroelectric leakage is zero, as per ACM 0002. | OK | |
| E.2.6. Are uncertainties in the leakage estimates properly addressed? | /PDD/ (E.2.) | DRI | In the context of such run-of-river hydroelectric leakage is zero, as per ACM 0002. | OK | |
| E.3. Baseline Emissions <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i> | | | | | |
| E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions? | /PDD/ (E.4.) (Annex 3) | DR | The baseline emission indicators are limited to amount of electricity supplied to the grid, grid CO ₂ emission factor according to ACM 0002. | Ok | |
| E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover | /PDD1/ (E.4.) | DR | Yes baseline boundaries have been clearly defined. | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| sources and sinks for baseline emissions? | | | | | |
| E.3.3. Are the GHG calculations documented in a complete and transparent manner? | /PDD1/ (E.4. Annex 3 Appendix 2) /XCS/ | DR | See the comment made in the section A.2.1 and in section B The coal consumption figure for Built Margin is mentioned in the "Emission Factor Sheet" as estimated. However, the same has been taken from CEA thermal performance review reports. | CR A1 CR B1- B4 & CAR B 1- B2 CR E1 | OK OK |
| E.3.4. Have conservative assumptions been used when calculating baseline emissions? | /PDD1/ (E.4. Annex 3 Appendix 2) | DR | Yes, see the comment made under section B | CR B1- B4 & CAR B 1- B2 | OK |
| E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation? | /PDD/ | DR | No uncertainties have been addressed in the PDD. | OK | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions? | /PDD/ | DR | No, the comments made under section E.3.4 for baseline emission apply. | CR A1 CR B1- B4 & CAR B 1- B2 | OK |
| E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations. | | | | | |
| E.4.1. Will the project result in fewer GHG emissions than the baseline scenario? | /PDD/ E.5 /XCS/ | DR | In this context of hydroelectric project emission reduction equates to baseline emission. The length of the crediting period (2007 to 2016) presented in the tabular form in the section E & A does not correspond to the starting dates of crediting period and 10 years of crediting period (cp section C.2.2.1 & the excel calculation sheet). | CAR E1 | OK |
| F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i> | | | | | |
| F.1.1. Has an analysis of the environmental impacts of the project activity been | /PDD/ | DR,I | In the view of the comment received during hosting period, the section F.1. | CAR | OK |



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| sufficiently described? | (Section F) /IM01/ | | <p>requires following corrections and elaborations: Details of the amount of total land to be taken for the project are required to be included.</p> <p>The statement “there is no negative impact on the environment due to the project activity” is incorrect w.r.t the inherent impacts of construction and operational phases of project activities.</p> <p>The statements in the section F.1 “The scheme would help in conservation of forest by replacing the fire wood for cooking and heating purposes with electricity” and “With the availability of assured cost effective electricity, there is vast potential for the development of agro, horticultural and forest based industries” contradicts with section A.2 (it says that the power will be connected to the grid and exported to the Northern region) and the last para in section B.1.1 (it says the power will be exported to Punjab as per Power Purchase Agreement with Power</p> | F1 | |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | Trading Corporation) and also compare stake holder comment number 4. The statement “the irrigation facilities currently dry up in the lean discharge months...” stated in the PDD should be addressed in the view of public hosting comment number 9. | | |
| F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? | /PDD/ (Section F) /IM01/ /EIA/ /EC/ | DR,I | Yes, Environmental clearance have obtained base on rapid EIA carried out by Centre for Inter-Disciplinary Studies of Mountain & Hill Environment. | OK | |
| F.1.3. Will the project create any adverse environmental effects? | /PDD/ (Section F) EIA /IM01/ | DR,I | Causes minimal environmental impact. | OK | |
| F.1.4. Are transboundary environmental impacts considered in the analysis? | /PDD/ (Section F) /IM01/ | DR,I | No transboundary impact has been envisaged from this project activity. | OK | |
| F.1.5. Have identified environmental impacts been addressed in the project design? | /PDD/ | DR,I | Refer Section F.1.1 and CAR F1 | CAR F1 | OK |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | (Section F.) /IM01/ | | | | |
| F.1.6. Does the project comply with environmental legislation in the host country? | /PDD/ /IM01/ /EC/ /FC / | DR,I | As per Environmental Management Plan, SPEL complying all environmental as well as forest norms applicable to the project site. | OK | |
| G. Comments by Local Stakeholder <i>Validation of the local stakeholder consultation process.</i> | | | | | |
| G.1.1. Have relevant stakeholders been consulted? | /PDD/ (Section G.) /LSC/ | DR | Yes, stakeholder consultation has been conducted on 02 Dec'05. | OK | |
| G.1.2. Have appropriate media been used to invite comments by local stakeholders? | /PDD/ (Section G.) | DR | Through local newspaper to main target group well in advance of the meeting held at site. | OK | |
| G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws? | /imef/ /LSC/ /MA/ /EC/ | | Not required for CDM project as per Indian Law. However, as a part of Environmental Clearance process, Public Hearing (related to the environmental concerns of the project to the local stakeholders) has been carried out. In the context of the local stakeholder consultation carried out in Dec'05, | CAR | OK |



| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|--------------------------------|------|---|-----------------|-----------------|
| | | | description and evidence stated (two paper advertisement dated 5/4/01 and 6/4/01 for 11 MW hydel project) in the section G1 of the PDD should be described in open and transparent manner (as per 22.5 MW project activity). | G1 | |
| G.1.4. Is a summary of the stakeholder comments received provided? | /PDD/ (Section G.) /LSC/ | DR | Yes, as required by the modalities & procedures of CDM, a summary of the comments is included in the section G.2 of PDD. Refer the comment under G.1.3 and CAR G.1 | CAR G1 | OK |
| G.1.5. Has due account been taken of any stakeholder comments received? | /PDD/ (Section G.) /LSC/ | DR | Yes, a note on how due account was taken of the concerns raised in the above public consultation is included in the section G.3 of the PDD. This also states that appropriate immediate responses were provided to them. SPEL has also signed a deed with the local people. In the view of the comment received during hosting period, the section G.3. requires following corrections and elaborations in the context of land inundation mentioned in the PDD: "land inundation would not occur due to the BHPP". | CAR G2 | OK |

Table 3: Resolution of Corrective Action and Clarification Requests

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---------------------------------------|---|--|
| CAR B1 The version number of ACM 0002 mentioned in the section B & D of the PDD is not current, ie, version 06. | B.2.1 | The version number has been updated in the revised PDD. | OK |
| CAR B2 The values of the 'total low cost power generation' for the years 2002-03, 2003-04, 2004-05 in Annex-3 is incorrect and the data vintage should be updated for the recent available official data source, ie, for the year 2005-06. | B.2.5 | The necessary corrections have been made in Annex-3. Please refer the revised PDD and updated baseline excel sheets. | The correction made in the Annex-3 table and the baseline excel sheet are OK. |
| CAR B3 The references of the Tehri Dam are inappropriate for this run of river project activity and the section B.3 should be appropriately corrected. | B.2.7. | The reference of Tehri Dam has been given in light of the fact that inundation fear had crept into the mind of the people due to the proximity of the two projects. The local people have been informed that the project being a run-of the river project does not involve water storage hence no inundation would occur. | The corrections and justifications made in section B.3 of PDD are convincing to the validation team. |
| CAR B4 The figure of existing hydropower capacity in India at 27 000 MW stated in step 4 of section B.3 of the PDD is outdated (Cp. www.powermin.nic.in). Moreover, the values for installed hydropower in Uttaranchal (Page 10 and 11 of the PDD), ie, 954.15 MW contradicts with the values in page 13 ,ie, | B.2.7. | As the figures mentioned are outdated and incorrect so the same have been removed in the revised version of the PDD. In the context of the revised PDD the earlier data is not relevant. | The corrections made and context for revising the PDD are OK. |



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---------------------------------------|---|--|
| 1478.24 MW. The “Monthly reports (March 2006)” of the CEA show for Uttaranchal: 978 MW (State Sector) and additional 400 MW (Central Sector / NHPC) – and the Theri Powerstation with 0 MW because it don’t work – so the capacity is much more than 954.15 MW total installed hydropower in Uttaranchal. | | | |
| CAR D1 Some of the required parameters mentioned in ACM0002 is missing in the monitoring plan (for example plant name, fuel quantity, emission factor coefficient etc for determination of simple OM & BM) | D.4.1 | Please refer the revised PDD and the attached baseline excel sheets. The emission factor calculation has been done ex-ante, therefore the emission factor remains fixed for the fixed crediting period (10 years) which cannot be renewed. Hence, these parameters are not to be monitored and thus are not a part of the monitoring plan. | The revised PDD addresses the same in correct way. |
| CAR E1 The length of the crediting period (2007 to 2016) presented in the tabular form in the section E & A does not correspond to the starting dates of crediting period and 10 years of crediting period (cp section C.2.2.1 & the excel calculation sheet). | E.4.1 | The crediting period has been corrected. Please check the revised PDD and the baseline excel sheets. As fixed crediting period of 10 years has been opted for the project activity and the tentative crediting period start date is from 16 th April 2007 and thus the crediting years are not in terms of calendar years rather they are in the form of 12 month periods. | The corrections made in the PDD are OK. |



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---------------------------------------|--|--|
| <p>CAR F1</p> <p>In the view of the comment received during hosting period, the section F.1. requires following corrections and elaborations: Details of the amount of total land to be taken for the project are required to be included.</p> <p>The statement “there is no negative impact on the environment due to the project activity” is incorrect w.r.t the inherent impacts of construction and operational phases of project activities.</p> <p>The statements in the section F.1 “ The scheme would help in conservation of forest by replacing the fire wood for cooking and heating purposes with electricity” and “With the availability of assured cost effective electricity, there is vast potential for the development of agro, horticultural and forest based industries” contradicts with section A.2 (it says that the power will be connected to the grid and exported to the Northern region) and the last para in section B.1.1 (it says the power will be exported to Punjab as per Power Purchase Agreement with Power Trading Corporation) and also compare stake holder comment number 4.</p> | F.1.1, F.1.5. | <p>The land requirement detail has been incorporated in the revised PDD.</p> <p>There are minimal negative impacts due to the project activity and the same have been incorporated in the revised PDD.</p> <p>The project activity would be connected to the sub-station and would improve the power availability situation as the Northern grid is facing severe shortage of power. The contradictory statements have been rectified and removed.</p> | <p>The revisions to section F.1 are OK. The referred documents provided have been verified: /FC/, /EIA/, /DPR/ and /LSC-1 & 4/. CAR is closed.</p> |



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|--|---------------------------------------|--|--|
| <p>The statement “the irrigation facilities currently dry up in the lean discharge months...” stated in the PDD should be addressed in the view of public hosting comment number 9.</p> | | <p>The statement is based on the DPR-Vol-1, Section 12.3.5. The agreement with the concerned villages (dated 02-12-2005) provides for protecting the irrigation discharges into the concerned existing irrigation channels. Please refer to the attached document Memo/S.T. Phalenda/06 dated 04.05.2006.</p> | |
| <p>CAR G1</p> <p>In the context of the local stakeholder consultation carried out in Dec'05, description and evidence stated (two paper advertisement dated 5/4/01 and 6/4/01 for 11 MW hydel project) in the section G1 of the PDD should be described in open and transparent manner (as per 22.5 MW project activity).</p> | <p>G.1.3., G.1.4.</p> | <p>Corrections have been made in the revised PDD. The local stakeholder consultation in context of the project activity being 22.5 MW has been done and the supporting documents for the same have been provided.</p> <p>The NOC from the adjoining villages has been obtained. Please refer the attached NOC documents from the following villages:</p> <p>Village Phalenda – Meeting date 01-04-2003</p> <p>Village Baheda – Meeting held on 31-08-2003 and the NOC letter received on 13-09-2003</p> <p>Village Chawasera – dated 25-10-2004</p> <p>Village Ransol – dated 20-12-2004</p> | <p>The supporting documents ^{/LSC-5/} are OK.</p> |



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|--|---------------------------------------|---|--|
| CAR G2 In the view of the comment received during hosting period, the section G.3. requires following corrections and elaborations in the context of land inundation mentioned in the PDD: "land inundation would not occur due to the BHPP". | G.1.5 | The PDD has been appropriately corrected. | OK |
| CR A1 The figure of estimated net electricity supply, i.e., 130.59 GWh in the PDD does not match with the figure in the Detail Project Report (Vol-I, page 21/166), ie, 121.956 GWh. Clarification is requested. The basis of the estimated figure requires to be justified. | A.2.1 | The generation figure has been updated as stated in the DPR, page 21, Volume-1, April 2004, i.e., 121.956 GWh. The DPR has been prepared after an in-depth study of hydrology, topography, geotechnical investigations detailed discussions with civil contractors and equipment suppliers. Please refer the revised PDD and the baseline excel sheets. | DPR; the revised calculations in the PDD and the baseline excel sheets were verified and found OK. |
| CR B1 The official data sources for power generation mix of northern region for 00-01 & 01-02 years in Annex 3 of the PDD is not mentioned. | B.2.1, B.2.9 | Please refer the baseline excel sheets and the revised PDD for the reference of the data sources. The generation mix of northern region for 00-01 and 01-02 has been obtained from Northern Regional | The revisions in Annex 3 of the PDD and the baseline excel sheets are OK. |



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|--|---------------------------------------|---|--|
| | | Load Dispatch Center (NRLDC) annual reports 2000-01 and 2001-02 respectively. | Moreover, the 2000-01 data is no longer relevant as the latest 2005-06 data has also been incorporated. CR is closed. |
| CR B2 The imports from the connected electricity system is not accounted for the simple operating margin (cp D.2.1.4 of the PDD & the excel calculation sheet) | B.2.2. | The import data has been incorporated in the revised PDD and baseline excel sheets. | OK |
| CR B3 ACM0002 requires using local values of NCV and CO ₂ emission factor, where available. If no such values are available, country specific values (see e.g. IPCC Good Practice Guidance) are preferred to IPCC world-wide default values. The use of NCV value of coal (4593 kcal/kg) from NATCOM Report (containing 1994 data) is not justified in the context of local; national as well as current compared to India specific values published by Central Electricity Authority (Cp General | B.2.2 | The Natcom report is a recent report dated 16.06.2004. Natcom is India's Initial National Communication to the UNFCCC and the figures of calorific value of coal and emission factor for coal have been taken from the Natcom report available at the following link (http://www.natcomindia.org/pdfs/chapter2.pdf). Thus as per the methodology national value (Country specific) has been taken instead of IPCC default values. | The date of the report has been verified from the report foreword, in the web-link provided. Natcom gives a national value and is from its latest report. Data relevance has been checked from |

Validation Report:

22.5 MW Bhilangana Hydro Power Project (BHPP)

TÜV NORD JI/CDM Certification Program

P-Nr.: 5320406-06/18



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|--|---------------------------------------|--|--|
| Review Report 2006, 2005, 2004 – chapter 6). | | <p>As per the methodology ACM0002, Net Calorific Value (NCV) is to be considered for emission factor calculation. The CEA review report gives the average calorific value and not the NCV. Thus Natcom value has been taken as the basis for calculation of the emission factor for coal as it specifically gives the India specific NCV of coal.</p> <p>The relevance (applicability) of the Natcom value is also strengthened by the usage of the same in registered CDM project. There is registered project using Natcom value for emission factor calculation (http://cdm.unfccc.int/UserManagement/FileStorage/PIU46TBNF15IHQASMU1B5TJBWAE9WP, page 11 of 30).</p> | the registered project PDD reference available on web-link provided. CR is closed. |
| CR B4 The coal generation figure, i.e., 240570.42MU in the 02-03 generation sheet does not match with Emission Factor sheet, i.e., 98724.42 MU. The similar mismatch of 04-05 gas generation figures (14362.83 vs. 19890.00). This is based on sample check. | B.2.5 | The values have been rechecked and have been found to be correct. | OK |



| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|--|---------------------------------------|--|--|
| CR B5 The statement in the section B.3. sub-step 4b “similar options as that of BHPP is not existent as of now” is not clear w.r.t the project capacity range. Justify the same w.r.t current officially available data. | B.2.7. | Please refer to the attached document on the weblink (http://www.cea.nic.in/hydro/List%20of%20Hydroelectric%20Stations%20in%20the%20Country.htm) wherein the latest list (as on 30-04-2006) of hydro-electric stations in India above 3 MW has been stated. As given in the weblink, there is no reference of any private party hydroelectric station in the state of Uttaranchal. The existing hydro-electric stations are being operated by the state body – Uttaranchal Jal Vidyut Nigam (UJVNL). | Checked in the web-link is OK. CR is closed. |
| CR D1 The format of the table under D.2.1.3. does not corresponds to ACM 0002. | D.4.1 | The table format is as per the latest format prescribed for the PDD preparation (page 6). | OK |
| CR E1 The coal consumption figure for Built Margin is mentioned in the “Emission Factor Sheet” as estimated. However, the same has been taken from CEA thermal performance review reports. | E.3.3 | The editorial correction has been made in the baseline excel sheet. Please refer the revised baseline excel sheet. | OK |