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# VALIDATION REPORT

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Ecoinvest Carbon Brasil Ltda. Cooperativa Regional de Eletrificação Rural do Alto Uruguai Ltda (CRERAL). Cooperativa Eletrificação Rural Fronteira Noroeste Ltda (COOPERLUZ). Cooperativa Regional de Energia e Desenvolvimento Ijuí Ltda (CERILUZ).

## Rio Grande do Sul Cooperatives Small Hydro Power Plants

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### **SGS Climate Change Programme**

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#### Summary

SGS has performed a validation of the project: Rio Grande do Sul Cooperatives Small Hydro Power Plants. The Validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. Using a risk based approach, the review of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

The project activity consists of newly built 3 small hydroelectric power plants: Cascatas Andorinhas, Caraguatá and Linha Três Leste with 16.283 MW total installed capacity. The Cascata das Andorinhas is a run-of-river that not requires any damming of water, and the two SHPs have a small reservoir. The plants are located in the South Region of Brazil, Rio Grande do Sul state, Brazil.

Total amount of emission reductions estimated for the first crediting period is 175,090tCO<sub>2</sub>e.

The SGS will request the registration of the Rio Grande do Sul Cooperatives Small hydro Power Plants as a CDM project activity, once the written approval by the DNA of the participating Parties and the confirmation by the DNA of Brazil that the project assists in achieving sustainable development has been received.

Subject.:		
CDM validation		Indexing terms
Work carried out by		
Fabian Gonçalves, Geisa Principe.		
Technical review		

Marco van der Linden.		<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organisational unit
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## Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CER	Certified Emission Reduction
DNA	Designated National Authority
MP	Monitoring Plan
NIR	New Information Request
PDD	Project design Document
SGS	Société Générale de Surveillance
EF	Emission Factor

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Annex 1: Local assessment

Annex 2: Validation Protocol

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## **1. Introduction**

### **1.1 Objective**

The COOPERATIVA REGIONAL DE ELETRIFICAÇÃO RURAL DO ALTO URUGUAI LTDA (CRERAL), COOPERATIVA ELETRIFICAÇÃO RURAL FRONTEIRA NOROESTE LTDA (COOPERLUZ), COOPERATIVA REGIONAL DE ENERGIA E DESENVOLVIMENTO IJUÍ LTDA AND ECOINVEST CARBON BRASIL LTDA has commissioned SGS to perform the validation of the project: Rio Grande do Sul Cooperatives Small Hydro Power Plant with regard to the relevant requirements for CDM project activities. The purpose of a 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 relevant UNFCCC and host country 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 of the quality of the project and its intended generation of Certified Emission Reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

### **1.2 Scope**

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. SGS has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

### **1.3 GHG Project Description**

This report summarizes the results of the validation of Rio Grande do Sul Cooperatives Small Hydro Power Plants Project Activity, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by CRERAL, CERILUZ and COOPERLUZ and a site visit, located in Rio Grande do Sul., Brazil. During site visit, Cooperative's managers and Ecoinvest consultant were interviewed.

The purpose of the project activity consists of newly built hydro 3 small hydroelectric: Cascatas das Andorinhas, Caraguatá and Linha Três Leste with a 16.283 MW total installed capacity. The Cascata das Andorinhas SHP is a run-of-river that does not require any damming of water and Caraguatá and Linha Três Leste SHP's have a small reservoir with minor environmental impact. The SHP's plant complies with the Brazilian legal criteria that define small hydropower plant.

CRERAL (Cooperativa Regional de Eletrificação Rural do alto Uruguai Ltda.) is the owner of Cascatas das Andorinhas. CRERAL was originated in July, 1969 by farmer group with objective to attend communities without access the energy power.

COOPERLUZ (Cooperativa de Eletrificação e Desenvolvimento da Fronteira Noroeste Ltda) is the owner of the Caraguatá SHP. COOPERLUZ was originated in December, 1970 with objective to acquire and produce electric energy, distributing in rural and urban area.

CERILUZ (Cooperativa Regional de Energia e desenvolvimento Ijuí Ltda) is the owner of Linha Três Leste SHP. COOPERLUZ was originated in August, 1971 with preliminary objective of distribution system.

The yearly minimum energy output expected is 82,560 MWh. The project is connected to interconnected grid South-Southeast-Midwest.

Total amount of emission reductions estimated for the first crediting period is 172,452 tCO<sub>2</sub> e.

#### Baseline Scenario:

No investment in clean power generation; electricity generation from fossil-fuel thermal plants that would have otherwise been delivered to the interconnected grid and to isolated systems.

#### With-project scenario:

The project activity consists of the installation of newly built small 3 hydro plants with capacity of 16.283 MW. It will result in GHG emissions reductions avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to the grid and to isolated systems.

#### Leakage:

No leakage is anticipated.

#### Environmental and social impacts:

The environmental impact of the project activity is considered small considering the host country definition of small-hydro plants, given the small dam and reservoir size.

With the use of small hydropower facilities to generate electricity for local use and for delivery to the grid, the project displaces part of the electricity derived from diesel, a finite fossil fuel, and gives less incentive for the construction of large hydro plants which can have major environmental and social impacts.

Regarding the compliance with environmental legislation of the host country, the Brazilian regulation requires an environmental licensing process, including: the preliminary license (Licença Prévia or LP), the construction license (Licença de Instalação or LI); and the operating license (Licença de Operação or LO).

It was verified during the site visit that the plant obtained the preliminary, installation and operation licenses. The licenses were issued by the Rio Grande do Sul Environmental Agency (Fundação Estadual de Proteção Ambiental - FEPAM).

In order to implement measures to mitigate adverse impacts identified in the Environmental Impact Assessment, the company prepared Environmental Control Plans and Basic Environmental Project which were approved by FEPAM. They involve, among other: restoration of degraded areas; water resources monitoring; control of erosion; monitoring and rescue of fauna and archaeological rescue.

Regarding social and economic impacts, it is expected that small hydropower plants can provide local distributed generation, in contrast with the business as usual large hydropower and natural gas fired plants.

Section D of the PDD presented the contribution to Sustainable Development aligned with Brazilian priorities (Contribution to the local environmental sustainability; Contribution to the development of the quantity and quality of jobs, Contribution to the fair income distribution, Contribution to the technological development and capacity building, Contribution to the regional integration and relationships among other sectors). The project was also reviewed under the checklist of "World Commission on Dams Guidelines for Good Practice" (WCD, 2000 <http://www.dams.org/>).

It is expected that the project activity will contribute to improve the supply of electricity, while contributing to the environmental, social and economic sustainability.

#### 1.4 The names and roles of the validation team members

Name	Role
Fabian Gonçalves – SGS Brazil	Lead Assessor
Geisa Principe – SGS Brazil	Local assessor
Irma Lubrecht – SGS NL	Technical reviewer

## 2. Methodology

### 2.1 Review of CDM-PDD and additional documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

A site visit is usually required to verify assumptions in the baseline. Additional information can be required to complete the validation, which may be obtained from public sources or through telephone and face-to-face interviews with key stakeholders (including the project developers and Government and NGO representatives in the host country). These may be undertaken by the local SGS affiliate. The results of this local assessment are summarized in Annex 1 to this report.

### 2.2 Use of the validation protocol

The validation protocol used for the assessment is partly based on the templates of the IETA / World Bank Validation and Verification Manual and partly on the experience of SGS with the validation of CDM projects. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	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 (Y), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>New Information Request (NIR)</b> is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex 2 to this report

### 2.3 Findings

As an outcome of the validation process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **New Information Request (NIR)** specifying what additional information is required.

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR)**. A CAR

is issued, where:

- I. mistakes have been made with a direct influence on project results;
- II. validation protocol requirements have not been met; or
- III. there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be verified.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

**Observations** may be raised which are for the benefit of future projects and future verification or validation actors. These have no impact upon the completion of the validation or verification activity.

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex 3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

### 2.4 Internal quality control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

## 3. Determination Findings

### 3.1 Participation requirements

Brazil is listed as the host Party. Brazil has ratified the Kyoto Protocol on 23<sup>rd</sup> August 2002 ([http://unfccc.int/files/essential\\_background/kyoto\\_protocol/application/pdf/kpstats.pdf](http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf)).

At time of the validation, no Letter of Approval from the host country had been provided. The Letter of Approval will be signed when the DNA of Brazil receive and analyse the validation report.

### 3.2 Baseline selection and additionality

The methodology applied to this Project Activity is: ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources/ Consolidated monitoring methodology for grid-connected electricity generation from renewable sources" (version 06, issued on 19<sup>th</sup> May, 2006).



ACM 0002 is applicable to grid-connected renewable power generation project activities which include among other conditions “hydro power projects with existing reservoirs where the volume of the reservoir is not increased.”

The project consists of installation of newly built 3 small hydroelectric power plants: Cascata das Andorinhas, Caraguatá and Linha Três Leste with a 16.283 MW of total installed capacity. The project boundaries are defined by the emissions targeted or directly affected by the project activities. It encompasses the physical, geographical site of the hydropower generation and the interconnected grid. The baseline calculation boundary is covered by the South-Southeast-Midwest integrated electric grid and all plants are connected to this grid and baseline calculations use the electric generation data from this region. The table with gases included in the project boundary is presented in section B.4 of the PDD. The CAR 1 was raised. The PDD was revised and CAR1 was close out.

The step 0 was not applicable because this project is not requiring retroactive credits, it was provided an analysis which is similar to step 0 of the additionality tool, and CAR 2 was raised. The three plants started operation in 2003 and 2004. During site visit was provided three Minutes of Meeting held by the Federation on June 17<sup>th</sup> 2003 (Ceriluz and Ceral SHPs) and July 20<sup>th</sup> 2004 (Cooperluz) which evidence the discussion about CDM projects in the cooperatives activities. CAR 2 was close out. The discussion on the additionality was not clear, mainly about the investment barrier. Transparent evidence related to the IRR analysis, as spreadsheets with formulas and specific source of the graphics presented in the PDD. NIR 3 was raised. The spreadsheet was sent to the validator, presenting data and formulas to demonstrate how IRR was determined. The data with source of the figures were up dated. Verified that the Internal Rate of Return -7.49% for Cascatas das Andorinhas, 6.23% for Caraguatá and 14.57% for Linha Três Leste. Comparing to SELIC rate of 25% during end 2002 and 2003, the financial IRR is lower.

Project sponsors chose to invest in the power plant because, they are farmer cooperatives and to ensure electricity supply in case of lack in the interconnected grid (problems with energy supplier). NIR 3 was close out.

The lack of infrastructure in the region of the project activity, such as roads, reliable electricity supply, communication and transports was a significant barrier. In addition there were no qualified personnel available in the region due of the lack of schools and universities. It was confirmed by local assessor during the site visit.

The institutional barrier and the common practice analysis discussed in the PDD were supported by sufficient information and references. The sources and information mentioned (data available in ONS, ANEEL and Eletrobrás websites) were confirmed by the assessors. Also information publicly available at BNDES website was verified. The PDD demonstrated that in absence of the incentive created by the CDM; this project would not be the most attractive scenario. The alternative to the project activity is the continuation of the current (previous) situation of electricity supplied by large hydro and thermal power stations – or by Diesel oil, in the case of isolated systems. As an alternative for the group company is the investment in other opportunities, like the financial market or in other traditional industrial areas of the group.

As required in the ACM 0002, the project demonstrated additionality using the “Tool for the demonstration and assessment of additionality”.

### **3.3 Application of Baseline methodology and calculation of emission factors**

As defined in the ACM0002, the baseline emission factor is calculated as a combined margin, consisting of the combination of operating margin and the build margin factors. The calculation of the emission factor of Brazilian South-Southeast-Midwest grid is based on data from the National Electric System Operator (ONS – Operador Nacional do Sistema Elétrico) covering years 2003 -2005.

During the desk study it was verified that the emission factor calculation. It was used the most recent value available. The emission factor calculated was 0.2611 tCO<sub>2</sub>e/MWh.

### **3.4 Application of Monitoring methodology and Monitoring Plan**

During the draft validation, it was verified that the monitoring plan did not cover all requirements of ACM0002. Issues were raised, as described below:

- CAR 4: Section B.6.2 of the PDD presented the parameters available at validation. The table with EF was not according to the template, and EF build margin, lambda and Area didn't present the "Justification of the choice of data..." CAR 4 was raised. The PDD was revised and CAR 4 was close out.

- NIR 5: It was not presented information about procedure for training and monitoring personnel. During site visit was presented certificate of training of the operators and Operation and Maintenance Manual. NIR 5 was close out.

- NIR 6: It was not presented procedures for other potential emergencies and troubles. The procedures were presented and NIR 6 was close out.

- NIR 7: The PDD mentioned that manufacturer is responsible for the calibration and maintenance. It was not presented the procedure, certificate and calibration periodicity. NIR 7 was raised. The procedures were presented during site visit. Each sponsor's project will be responsible for the calibration and maintenance. NIR 7 was closed out.

CAR 8: This project involves three small hydro plants. The PDD mentioned that maintenance, monitoring, measurements, records handling, review of reported results, internal audits, adjustments and uncertainties was under Cooperatives responsibility. It was verified the procedure (copy was provided) for each plant. Each cooperative is responsible for the calibration, maintenance of the monitoring equipment, measurements, records of documentation, as well as for data collection and archiving, for monitoring data adjustments, and uncertainties, for review of results/data, internal audit and for corrective actions (see Annex 4 of the PDD) CAR 8 was close out.

Considering that the CAR and NIR above were adequately addressed, the validation team accepted the monitoring plan described in the PDD.

### **3.5 Project design**

The project's starting date (15<sup>th</sup> December 2004 – Caraguatá; 31<sup>th</sup> December 2003 – Linha Três Leste and 15 September 2003 – Cascata das Andorinhas SHP) and operational lifetime (50 years) were clearly defined in the PDD and are reasonable. It was assumed a renewable crediting period which will start on 15<sup>th</sup> July 2007 operational lifetime exceeds the crediting period.

The project design engineering reflects current good practices and is not likely to be substituted by other or more efficient technologies within the project period. Small hydro is considered to be one of the most cost effective power plants in Brazil.

### 3.6 *Environmental Impacts*

The environmental impact of the project activity is considered small by host country definition of small hydro plants.

The project sponsors obtained all licenses required by Brazilian Environmental Regulation.

The local assessor verified the Environmental Assessment that includes environmental studies. Studies done during the design phase of the project have identified the environmental and social impacts and indicated the mitigation measures to be adopted during the construction and operation phases. A team of experts are monitoring the compliance with the environmental regulation.

During the site visit, the above-mentioned information was verified through document review, interviews with Cooperative's managers. It was also verified that the analysis of the environmental impacts of the project activity was sufficiently described in the documents related to the environmental licensing of the plant. Adverse environmental effects were identified and mitigating measures were defined to address these impacts.

### 3.7 *Local stakeholder comments*

List of stakeholders was presented in the PDD. Verified the letters sent in local language to local stakeholders. List of stakeholders was presented in the PDD and comply with Resolução nº1. Copy of the letters and delivery receipt was provided. The comments received are favourable to the project. Received comments supports the project and do not request an answer.

## 4. *Comments by Parties, Stakeholders and NGOs*

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

### 4.1 *Description of how and when the PDD was made publicly available*

The PDD and the monitoring plan for this project were made available on the SGS website <http://cdm.unfccc.int/Projects/Validation/DB/4342GJPEDX4LNETGJW6H2JDQAKHDSL/view.html> and were open for comments from 17 Oct 2006 until 15 Nov 2006. Comments were invited through the UNFCCC CDM homepage.

### 4.2 *Compilation of all comments received*

<b>Comment number</b>	<b>Date received</b>	<b>Submitter</b>	<b>Comment</b>
0			

### 4.3 *Explanation of how comments have been taken into account*

No comment received.

## **5. Validation opinion**

Steps have been taken to close out 8 findings.

SGS has performed a validation of the project: Rio Grande do Sul Cooperatives Small Hydro Power Plants.

The Validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. Using a risk based approach, the review of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

By the displacement of fossil fuels by renewable energy sources in the generation of electricity, the project results in reductions of greenhouse gas emissions that are real, measurable and give long-term benefits to the mitigation of climate change. A review of the financial analysis and barriers presented demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. If the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

The validation is based on the information made available to SGS and the engagement conditions detailed in the report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence SGS can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

## 6. List of persons interviewed

<b>Date</b>	<b>Name</b>	<b>Position</b>	<b>Short description of subject discussed</b>
6 Nov 2006	CERILUZ	Manager	TECHNICAL ISSUES, OPERATIONAL ISSUES, FINDINGS, MONITORING PLAN, BASELINE, LICENSES.
6 Nov 2006	Benoni Hedlund	Manager assessor - COOPERLUZ	Quality procedures.
6 Nov 2006	Emerson Sichinal	Engineer - COOPERLUZ	Operational
6 Nov 2006	Vicento	Vice-president	Manager - Cooperluz
6 Nov 2006	Luiz Fernando	Assessor	Assessor - CRERAL
6 Nov 2006	Renato	Technical	Technical issues - COOPERLUZ
6 Nov 2006	Jenny Sayaka	Project developer	Validation process and findings.

## 7. Document references

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1/ Project Design Document, Rio Grande do Sul Cooperatives Small Hydro Power Plants in Rio Grande do Sul, Brazil. Version 1, 07/08/2006; Version 2, 21/11/2006; Version 3, 08/12/2006, version 4, 22/01/2007.
- /2/ ACM0002- Consolidated methodology for grid-connected electricity generation from renewable sources, version 6, 19 May 2006.
- /3/ Tool for the demonstration and assessment of additionality, version 2, 28 November 2005.

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /4/ Worksheet: financial analysis.
- /5/ Worksheet: CER
- /6/ Meeting CDM project – STEP 0 – CRERAL, CERILUZ and COOERLUZ.
- /7/ Certificate of training – CRERAL, CERILUZ and COOPERLUZ.
- /8/ Specification of the equipments.
- /9/ Procedures – CRERAL, CERILUZ and COOPERLUZ.

- /10/ ANEEL license – CRERAL, CERILUZ and COOPERLUZ
- /11/ Operation license – CRERAL, CERILUZ and COOPERLUZ
- /12/ Financing – CRERAL, CERILUZ and COOPERLUZ
- /13/ Social contract – CRERAL, CERILUZ and COOPERLUZ
- /14/ Calibration – CRERAL, CERILUZ and COOPERLUZ

Insert the following documents here and delete this message:

## Annex 1 - Local assessment checklist

### Rio Grande do Sul Cooperatives Small Hydro Power Plants

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document. It serves as a “reality check” on the project. It is to be completed by a local assessor from SGS Brazil.

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Verify operation license from ANEEL (National energy agency) for each plant. Check if the PDD information can be confirmed with the specification described in the licenses.	<p>Linha 3 Leste SHP (14,335MW relating to total capacity), license ANEEL N° 6, 7 January 2004.</p> <p>Caraguatá SHP, license ANEEL N° 656, 23 October 2002.</p> <p>Cascata das Andorinhas SHP, N° 492, 24 July 2001.</p>	DR/ site visit	No

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Verify PPA (Power purchase agreement) for each plant.	There is no PPA. The energy has been sold for the association. There is contract between association and cooperative (copy was provided).	DR/ site visit	No
Verify evidences of the starting date of the SHPs.	It was verified operation license that prove the starting date. Caraguatá SHP: 15 <sup>th</sup> December 2004; Linha 3 Leste SHP: 22 <sup>nd</sup> December 2003; Cascata das Andorinhas SHP: 15 <sup>th</sup> July 2003.	DR/ site visit	No
Verify reservoir area (they comply with the PDD information and with the environmental licenses?).	During site visit was verified reservoir area and copy of the maps was provided. Caraguatá SHP: 1,1ha. Linha 3 Leste SHP: 130,6ha. Cascata das Andorinhas: 0 (run-of-river).	DR/ site visit	No
Verify project installed as described in the PDD.	Verified the equipments, turbines, generators, and meters.	DR/ site visit	No
Verify Social contract of the Cooperatives.	It was verified each social contract (copy was provided). Ref 13	DR/ site visit	No

## ANNEX 2 - VALIDATION PROTOCOL

THIS VALIDATION PROTOCOL IS DESIGNED TO ENSURE THAT THE PROJECT MEETS THE REQUIREMENTS FOR CDM PROJECTS THAT ARE DETAILED IN PARAGRAPH 37 OF THE CDM MODALITIES AND PROCEDURES. EACH REQUIREMENT IS COVERED IN A SEPARATE TABLE. THE FOLLOWING REQUIREMENTS ARE DISCUSSED IN THIS PROTOCOL:

### Requirement

### Description

Participation

The participation requirements as set out in

Covered in table 1



requirements	Decision 17/CP7 need to be satisfied	
Baseline and monitoring methodology	The baseline and monitoring methodology complies with the requirements pertaining to a methodology previously approved by the Executive Board	Baseline methodology is covered in table 2 Monitoring methodology is covered in table 4
Additionality	The project activity is expected to result in a reduction in anthropogenic emissions by sources of greenhouse gases that are additional to any that would occur in the absence of the proposed project activity	Covered in table 3
Monitoring plan	Provisions for monitoring, verification and reporting are in accordance with relevant decisions of the COP/MOP	Covered in table 5
Environmental impacts	Project participants have submitted to the designated operational entity documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts and, if those impacts are considered significant by the project participants or the host Party, have undertaken an environmental impact assessment in accordance with procedures as required by the host Party;	Covered in table 6
Comments by local stakeholders	Comments by local stakeholders have been invited, a summary of the comments received has been provided, and a report to the designated operational entity on how due account was taken of any comments has been received;	Covered in Table 7
Other requirements	The project activity conforms to all other requirements for CDM project activities in relevant decisions by the COP/MOP and the Executive Board.	Covered in Table 8

Small sale projects and AR projects have specific requirements which are covered in Table 9-11. Small scale SSC projects have special requirements which might deviate from the requirements of other CDM projects. These requirements are tested in table 9. Please note that some questions in table 9 overlap with questions in the other tables. Where the questions in table 9 contradict or overlap questions elsewhere in the checklist, the questions in table 9 shall prevail. For the validation of small scale projects, assessor is required to address the questions in table 9 first before starting with the questions in the other tables.

Further remarks on the use of this document:

- text in *italic blue* is meant as guidance for the assessor
- MoV = Means of Verification, DR= Document Review, I= Interview

This protocol should be adapted as required. For example, if the project is not a small scale project or an AR project, some tables can be deleted.



**TABLE 1 PARTICIPATION REQUIREMENTS FOR CLEAN DEVELOPMENT MECHANISM (CDM) PROJECT ACTIVITIES (REF PDD, LETTERS OF APPROVAL AND UNFCCC WEBSITE)**

REQUIREMENT	MoV	Ref	Comment	Draft finding	Concl
1.1 The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3 and be entered into voluntarily.	DR	PDD	No Annex I country in this project.	Ok	Ok
1.2 The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	DR	PDD	No Letter of Approval by host country (Brazil) has been submitted to the validator. The letter will be issued by the DNA after they analyse the validation report.	Send the validation report to DNA	
1.3 All Parties (listed in Section A3 of the PDD) have ratified the Kyoto protocol and are allowed to participate in CDM projects	DR	UNFCCC web site	Yes, Brazil: 23 August 2002.	Ok	Ok
1.4 The project results in reductions of GHG emissions or increases in sequestration when compared to the baseline; and the project can be reasonably shown to be different from the baseline scenario	DR	PDD	The project activity reduces emissions of greenhouse gas as the result of the displacement of generation from fossil fuel thermal plants that would have otherwise been delivered to the Brazilian grid.	Ok	Ok
1.5 Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days (45 days for AR projects), and the project design document and comments have been made publicly available	DR	UNFCCC web site	PDD publicly available: 17 Oct 06 – 15 Nov 06. <a href="http://cdm.unfccc.int/Projects/Validation/DB/4342GJPEDX4LNETGJW6H2JDQAKHDSL/view.html">http://cdm.unfccc.int/Projects/Validation/DB/4342GJPEDX4LNETGJW6H2JDQAKHDSL/view.html</a> No comments received.	Verify	Ok
1.6 The project has correctly completed a Project Design Document, using the current version and exactly following the guidance	DR	PDD	No. The table with gases included in the project boundary was presented in section B.4 of the PDD. The correct is to present the table in section B.3. CAR 1 was raised.	CAR 1	Ok

REQUIREMENT	MoV	Ref	Comment	Draft finding	Concl
			PDD was revised and CAR 1 was close out.		
1.7 The project shall not make use of Official Development Assistance (ODA), nor result in the diversion of such ODA	DR	PDD	There is no Annex I in this project and does not make use of ODA.	Ok	Ok
1.8 For AR projects, the host country shall have issued a communication providing a single definition of minimum tree cover, minimum land area value and minimum tree height. Has such a letter been issued and are the definitions consistently applied throughout the PDD?			N/A		
1.9 Does the project meet the additional requirements detailed in: Table 9 for SSC projects Table 10 for AR projects Table 11 for AR SSC projects			N/A		
1.10 Is the current version of the PDD complete and does it clearly reflect all the information presented during the validation assessment.	DR	PDD	Yes. The current version 3 (28 July 2006) was used.	Verify	Ok
1.11 Does the PDD use accurate and reliable information that can be verified in an objective manner?	DR	PDD	<p>Considering only the information provided in the PDD, the following items could not be verified during the desk study:</p> <ul style="list-style-type: none"> <li>- Table 3 of the PDD with turbine and generator description.</li> <li>- Map of the reservoir or license to confirm the reservoir area and consequently the power density.</li> <li>- Reference year used in figure 7.</li> <li>- IRR with CER and without CER.</li> </ul> <p>It was verified during site</p>	Verify	Ok

REQUIREMENT	MoV	Ref	Comment	Draft finding	Concl
			<p>visit the information presented in table 3 of the PDD. Verified the technical specification of the Turbines and generators.</p> <p>It was verified the map of the reservoirs:</p> <p>Linha 3 Leste SHP: reservoir área = 1.306 Km².</p> <p>Caraguatá SHP: reservoir área = 0.011 km².</p> <p>Cascatas Andorinhas SHP: run-of-river.</p> <p>The reference year of the figure 7 was included in the PDD.</p> <p>Table 5: IRR with CER and without CER was corrected.</p>		

**TABLE 2 BASELINE METHODOLOGY(IES) (REF: PDD SECTION B AND E AND ANNEX 3 AND AM)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
2.1 Does the project meet all the applicability criteria listed in the methodology	PDD ACM 0002	DR	ACM0002 is applicable to grid connected renewable power generation project activities which include new hydro electric power projects with reservoirs having power density greater than 4 W/m2, this is applicable for Caraguatá Plant and Linha 3 Leste Plant. Cascata das Andorinhas is a run-of – river hydro power plant.	Ok	Ok
2.2 Is the project boundary consistent with the approved methodology	PDD ACM 0002	DR	Yes, the project boundary encompasses the physical, geographical site of the hydropower generation source,	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			represented by the river basin of the project and the interconnected grid. (Brazilian grid: South-Southeast-Midwest interconnected subsystem)		
2.3 Are the baseline emissions determined in accordance with the methodology described	PDD ACM 0002	DR	Yes, the baseline emission factor is defined as $EF_y$ and is calculated as a combined margin, consisting of the combination of operating margin and build margin factors. During desk study it was verified the emissions factor worksheet with the most recent data available. The baseline emissions is calculated by using the annual generation times the $CO_2$ average emission rate of the estimated baseline, as follows: Monitored project generation in MWh * Baseline emission rate factor in $tCO_2/MWh$ . In this project the emission factor calculated is 0.2611 $tCO_2/MWh$ .	Ok	Ok
2.4 Are the project emissions determined in accordance with the methodology described	PDD ACM 0002	DR	The methodology requires that the PE should be calculated from the power density.  The PDD presents the calculation of power density for Caraguatá and Linha Três Leste Plants.  Verify document to confirm the reservoir area and confirm the power density calculation: <ul style="list-style-type: none"><li>▪ SHP Caraguatá with installed capacity 0.953 MW and area of</li></ul>	Verify	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>reservoir 0.011 Km<sup>2</sup>. Power density = 86.63 W/m<sup>2</sup>.</p> <ul style="list-style-type: none"> <li>▪ SHP Linha 3 Leste with installed capacity 14.33MW and area of reservoir 1.306Km<sup>2</sup>. Power density = 10.97 W/m<sup>2</sup>.</li> <li>▪ SHP Cascata das Andorinhas, with installed capacity 1.0 MW. It is a run-of-river.</li> </ul> <p>Project emissions (PEy) are null for run-of-river hydropower.</p> <p>The power density is greater than 10W/m<sup>2</sup>, consequently, project emissions (PEy) = 0.</p>		
2.5 Is the leakage on the project activity determined in accordance with the methodology described	PDD ACM 0002	DR	Leakage is not applicable.	Ok	Ok
2.6 Are the emission reductions determined in accordance with the methodology described	PDD ACM 0002	DR	<p>Yes, verified the worksheet with ER calculation (Cálculo de redução) that corresponds with data presented in the PDD.</p> <p>See ref.5.</p>	Ok	Ok

**Table 3 Additionality (Ref: PDD Section B3 and AM)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
3.1 Does the PDD follow all the steps required in the methodology to determine the additionality	PDD Tool	DR	<p>No, the PDD do not present information under sub-step 4a.</p> <p>The step 0 is not applicable because this project is not requiring retroactive credits, but it is necessary to provide</p>	CAR 2	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>an analysis which is similar to step 0 of the additionality tool. The three plants started operation in 2003 and 2004. To provide evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. CAR 2 was raised.</p> <p>During site visit were provided three Minutes of Meeting held by the Federation on June 17<sup>th</sup> 2003 (Ceriluz and Ceral SHPs) and July 20<sup>th</sup> 2004 (Cooperluz) which evidence the discussion about CDM projects in the cooperatives activities. CAR 2 was close out. See ref.6.</p>		
3.2 Is the discussion on the additionality clear and have all assumptions been supported by transparent and documented evidence	PDD	DR	<p>The explanation about the investment barrier is not complete. To present the worksheet with IRR. Provide specific source of the graphics presented in the PDD to confirm the data (Figures 5, 6, 7, 8, 9). NIR 3 was raised.</p> <p>It was provided copy of the financial analysis.</p> <p>Verified the investment barrier:</p> <p>Internal Rate of Return -7.49% for Cascatas das Andorinhas, 6.23% for Caraguatá and 14.57% for Linha Três Leste. Comparing to SELIC rate of 25% during the end of 2002 and 2003, the financial IRR is lower. Although the project</p>	NIR 3	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>activity is less profitable than Brazilian government bonds. Project sponsors chose to invest in the power plant because, they are farmer's cooperatives and to ensure electricity supply in case of lack in the interconnected grid (problems with energy supplier).</p> <p>It was verified that the plants are located in a region isolated and lack of infrastructure is a barrier, due to the distance from cities, suppliers, roads, communication.</p> <p>There is no qualified personnel in the region; operators were trained (verified during site visit and copy of the certificates were provided). Ref 5</p> <p>All data and references presented in the PDD were confirmed.</p> <p>NIR 3 was close out. See ref. 4.</p> <p>The common practice in Brazil is the construction of large hydro power plants and most recently the thermal power plants is growing. Small hydro plants represent 1.54% of the total installed capacity in the country.</p> <p>According to the financial analysis presented, all hydro plants are not financial attractive compared with Selic rate. The CER revenue will bring additional financial</p>		

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>benefits to Caraguatá and Linha Três Leste plants and will reduce the negative IRR of the Cascata das Andorinhas plant.</p> <p>The project activity is not business as usual in the country, and another alternative could be the continuation of electricity supplied by large hydro and thermal plants.</p> <p>The cooperatives were originated to act in energy distribution and energy generation for your own consumption, because the farmers are located in a place with lack of infrastructure and problems with energy supplier.</p>		
3.3 Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	PDD	DR	<p>Yes, the alternative to the project activity is the continuation of the current situation of electricity supplied by large hydro power plants and thermal power plants.</p> <p>To be confirmed by local assessor.</p> <p>As alternative for the cooperatives could be to invest the resources in different financial market.</p>	Verify	Ok
3.4 Is it demonstrated/justified that the project activity itself is not a likely baseline scenario	PDD	DR	<p>To be confirmed by local assessor.</p> <p>The project activity is not the business as usual in the country, and other alternatives could be the continuation of electricity supplied by large hydro and thermal plants in the country or to invest in the financial market.</p>	Verify	Ok



**Table 4 Monitoring methodology (PDD Section D and AM)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
4.1 Does the project meet all the applicability criteria listed in the monitoring methodology	PDD ACM 0002	DR	Yes, two new hydro power plants with small reservoir and one run-of-river power plant.	Ok	Ok
4.2 Does the PDD provide for the monitoring of the baseline emissions as required in the monitoring methodology	PDD ACM 0002	DR	Section B.6.2 of the PDD presents the parameters available at validation. The table with EF is not according to the template, and EF build margin, lambda and Area do not present the "Justification of the choice of data..." CAR 4 was raised.  The PDD was revised. CAR 4 was close out.	CAR 4	Ok
4.3 Does the PDD provide for the monitoring of the project emissions as required in the monitoring methodology	PDD ACM 0002	DR	Yes, the PE is dependent on the reservoir area and installed capacity of the plants Caraguatá and Linha Três Leste. These parameters are used to calculate the Power Density. The power density for both plants is greater than $10W/m^2$ , consequently the $PE=0$ .  Cascata das Andorinhas plant is a run-of-river plant with no reservoir.	Ok	Ok
4.4 Does the PDD provide for the monitoring of the leakage as required in the monitoring methodology	PDD ACM 0002	DR	No leakage is anticipated.	Ok	Ok
4.5 Does the PDD provide for Quality Control (QC) and Quality Assurance (QA) Procedures as required in the monitoring methodology	PDD ACM 0002	DR	Yes, to be confirmed by local assessor.  All electricity data are controlled in the real time by SHP and are compared between the meters at the output of the generators and the meter in the substation.	Verify	Ok

**Table 5 Monitoring plan (PDD Annex 4)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
5.1 Monitoring of Sustainable Development Indicators/ Environmental Impacts					
5.1.1 Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	PDD	DR	<p>Annex 4 and section D of the PDD presents the environmental control plan programs.</p> <p>To be confirmed by local assessor:</p> <ul style="list-style-type: none"> <li>- Verify studies to obtain environmental licenses (section D.1).</li> <li>- Verify social programs implemented.</li> </ul> <p>Environmental and social programs described in annex 4 of the PDD are following environmental agency regulation.</p> <p>Programs were verified and copy was provided.</p> <p>Social programs: environmental education, seminars, reforestation, distribution of books and folders.</p>	Verify	Ok
5.1.2 Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	PDD	DR	See item 5.1.1	Verify	Ok
5.1.3 Will it be possible to monitor the specified sustainable development indicators?	PDD	DR	<p>Yes, according to the monitoring plan presented in table 9, section D.2 of the PDD.</p> <p>See item 5.1.1</p>	Verify	Ok
5.1.4 Are the sustainable development indicators in line with stated national priorities in the	PDD	DR	<p>To be confirmed by local assessor.</p> <p>The PDD presented a discussion under six</p>	Verify	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
Host Country?			items (social and environmental) of the World Commission on Dams. Recommendations checklist.		
5.2 Project Management Planning					
5.2.1 Is the authority and responsibility of project management clearly described?	PDD	DR	Yes, section B.7.2. Confirmed during site visit.	Verify	Ok
5.2.2 Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD	DR	Data collection, monitoring equipment is under responsibility of the cooperatives.	Verify	Ok
5.2.3 Are procedures identified for training of monitoring personnel?	PDD	DR	The cooperatives are responsible for training the staff in the appropriate monitoring, but there is no procedure identified for training and monitoring personnel. NIR 5 was raised.  Verified the training certificate of the operators and the Operation and Maintenance Manual.  NIR 5 was close out.  See ref.9.	NIR 5	Ok
5.2.4 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD	DR	Unintended emissions from the SHPs are not expected.  There are no procedures for other potential emergencies. NIR 6 was raised.  There are procedures for potential emergencies: CARAGUATÁ SHP: "Procedimento de monitoramento de geração de energia (energy generation	NIR 6	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>procedure)".</p> <p>USINA 3 LESTE SHP: "Procedimentos de monitoramento da geração de energia Usina Três Leste (Energy generation procedure)".</p> <p>CASCATA DAS ANDORINHAS SHP: "Manual de procedimentos para operação da CGH Cascata das Andorinhas (Energy generation procedure)".</p> <p>NIR 6 was close out.</p>		
5.2.5 Are procedures identified for calibration of monitoring equipment?	PDD	DR	<p>The PDD mention that manufacturer is responsible for the calibration and maintenance. To present the procedure, certificate and calibration periodicity. NIR 7 was raised.</p> <p>Verified the procedures for meter calibration. Each energy distribution will be responsible for the calibration and maintenance.</p> <p><b>Usina 3 Leste SHP ( 14.33 MW)</b></p> <p>Meter: ELO 2180, serial number 90001699, 115V, 10<sup>a</sup> – 60Hz.</p> <p>ELO calibration certificate, 30/03/2004, periodicity 5 years.</p> <p>Meter: ELO2180, serial number 90001606, 115V, 10A-60Hz.</p> <p>ELO calibration certificate, 09/07/2003, periodicity 5 years.</p> <p><b>Usina 3 Leste SHP (</b></p>	NIR 7	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p><b>0,835 MW)</b></p> <p>Meter: ELSTER, A3RBR, serial number 5000549, 120V, 2,5A-60Hz.</p> <p>ELSTER calibration certificate, 28/11/2006, periodicity 5 years.</p> <p><b>CARAGUATÁ SHP:</b></p> <p>Meter: COMAP INTELIGEN, 033470A serial number.</p> <p>COMAP calibration certificate, 09/03/2004, periodicity 10 years.</p> <p><b>CASCATA DAS ANDORINHAS SHP:</b></p> <p>Meter: Nansen, Spectrum SDAT R model, 00131449 and 00131450 serial numbers, 240V, 2, 5 A – 60Hz.</p> <p>Nansen calibration certificate, 16/09/2006.</p> <p>Calibration is not necessary during lifetime of the meter (15 years, defined by meter manufacturer).</p>		
5.2.6 Are procedures identified for maintenance of monitoring equipment and installations?	PDD	DR	<p>No. This project involves three small hydro plants. The PDD mention that maintenance, monitoring, measurements, records handling, review of reported results, internal audits, adjustments and uncertainties is under Cooperatives responsibility. To present the procedures implemented in each SHP. The plants need to follow the same monitoring plan to comply with ACM0002 methodology and PDD</p>	CAR 8	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>requirements. CAR 8 was raised.</p> <p>It was verified the procedure (copy was provided) for each plant. Each cooperative is responsible for the calibration, maintenance of the monitoring equipment, measurements, records of documentation, as well as for data collection and archiving, for monitoring data adjustments, and uncertainties, for review of results/data, internal audit and for corrective actions. (see Annex 4 of the PDD).</p> <p>CAR 8 was close out.</p>		
5.2.7 Are procedures identified for monitoring, measurements and reporting?	PDD	DR	See item 5.2.6	CAR 8	Ok
5.2.8 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	DR	See item 5.2.6	CAR 8	Ok
5.2.9 Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	PDD	DR	See item 5.2.6	CAR 8	Ok
5.2.10 Are procedures identified for review of reported results/data?	PDD	DR	See item 5.2.6	CAR 8	Ok
5.2.11 Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	PDD	DR	See item 5.2.6	CAR 8	Ok
5.2.12 Are procedures	PDD	DR	See item 5.2.6	CAR	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
identified for project performance reviews before data is submitted for verification, internally or externally?				8	
5.2.13 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	PDD	DR	See item 5.2.6	CAR 8	Ok

**Table 6 Environmental Impacts (Ref PDD Section F and relevant local legislation)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
6.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD	DR	Yes.	Ok	Ok
6.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD	DR	Verify EIA and other legal requirement. As described in the PDD, the environmental impact assessment of the project is not applicable. The following documents were verified during the site visit: Preliminary license; Construction license; Operation license.	Verify	Ok
6.3 Will the project create any adverse environmental effects?	PDD	DR	The environmental effects were considered by the environmental agency during the licensing process.	Verify	Ok
6.4 Are transboundary environmental impacts considered in the analysis?	PDD	DR	The transboundary environmental impacts were considered in the preliminary studies presented to the local environmental agency.	Verify	Ok
6.5 Have identified environmental impacts been addressed in the project design?	PDD	DR	The project obtained licenses required by the Brazilian environmental regulation.	Verify	Ok
6.6 Does the project comply with environmental legislation in the host	PDD	DR	To be confirmed by local assessor.	Verify	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
country?			<p>The plants obtained the legal required environmental licenses:</p> <p>CASCATA DAS ANDORINHAS SHP: Operation License – Nº. 6117/2004-DL, 05/08/2004.</p> <p>LINHA 3 LESTE SHP (14,33MW): Operation license, Nº 7185/2006-DL.</p> <p>CARAGUATÁ SHP: Operation license, Nº 7714/2004 – DL, 15/12/2004.</p>		

**Table 7 Comments by local stakeholders (Ref PDD Section G)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
7.1 Have relevant stakeholders been consulted?	PDD	DR	Yes.	Verify	Ok
7.2 Have appropriate media been used to invite comments by local stakeholders?	PDD	DR	<p>Verify letters sent to local stakeholders.</p> <p>Letters sent to stakeholders were verified. They are prepared in local language.</p>	Verify	Ok
7.3 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?	PDD	DR	<p>Yes, list of stakeholders is presented in the PDD section E.1.</p> <p>Verified copy of the letters sent and delivery receipts.</p>	Verify	Ok
7.4 Is a summary of the stakeholder comments received provided?	PDD	DR	Yes, section E.2 of the PDD. Three comments received.	Ok	Ok
7.5 Has due account been taken of any stakeholder comments received?	PDD	DR	Yes, section E.3 of the PDD. Two comments do not require an answer, and the other comment was addressed adequately.	Ok	Ok



**TABLE 8 OTHER REQUIREMENTS**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>8.1 Project Design Document</b>					
8.1.1 Editorial issues: does the project correctly apply the PDD template and has the document been completed without modifying/adding headings or logo, format or font.	PDD	DR	See CAR 1.	CAR 1	Ok
8.1.2 Substantive issues: does the PDD address all the specific requirements under each header. If requirements are not applicable / not relevant, this must be stated and justified	PDD	DR	Yes	Ok	Ok
<b>8.2 Technology to be employed</b>					
8.2.1 Does the project design engineering reflect current good practices?	PDD	DR	Yes.	Ok	Ok
8.2.2 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	DR/ site visit	<p>The equipments used were developed locally and has been used in other projects in Brazil.</p> <p><b>Linha 3 Leste SHP</b>  Kaplan turbine, 830 kW.  WEG generator, 1000 kVA, serial number 138391.  Meter: Elster, A3RBR model, serial number 5000549.</p> <p><b>Linha 3 Leste SHP</b>  3 Kaplan turbines, 5HR165 model, 360rpm, serial number 1152 (June, 2003), 1153 (July, 2003) and 1154 (September, 2003).  GE generators, 5000kVA, serial number 2TH227001264, 2TH227001265, 2TH227001266.</p>	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>Meter: ELO 2180SE-21-serial number 90001606 and 90001699.</p> <p><b>Cascata das Andorinhas SHP:</b></p> <p>Two turbines – FRANCIS, 700 kVA, cod. 074691-6.</p> <p>Two Generators – WEG SPA400, 751kVA/380V, serial number 110352 and 110353.</p> <p>Meter: NANSEN, SDAT-R model, serial number 00131449 and 00131450.</p> <p><b>Caraguatá SHP</b></p> <p>Kaplan turbine, SHR200 model, 1000kVA, serial number 124.675.</p> <p>Weg generator, SPD1120 model, 1050kVA, number 1183.</p> <p>Meter, COMAP, INTELIGEN, serial number 033470A.</p>		
8.3 Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD	DR/site visit	It is not expected.	Ok	Ok
8.2.4 Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	PDD	DR/site visit	<p>To be confirmed by local assessor.</p> <p>The operators were trained.</p>	Verify	Ok
<b>8.3 Duration of the Project/ Crediting Period</b>					
8.3.1 Are the project's starting date and operational lifetime clearly defined and reasonable?	PDD	DR	<p>Yes, section C of the PDD.</p> <p>To confirm the starting date and operational lifetime by document review.</p> <p>Section C.1.1 – starting date of the project activity:</p> <p>Caraguatá SHP: 15 December 2004;</p>	Verify	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			Linha 3 Leste SHP: 31 December 2003; Cascata das Andorinhas SHP: 15 July 2003. Operational lifetime 50 years.		
8.3.2 Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	PDD	DR	Renewable crediting period: 7 years.	Ok	Ok
8.3.3 Does the project's operational lifetime exceed the crediting period	PDD	DR	Yes.	Ok	Ok

**TABLE 9 ADDITIONAL REQUIREMENTS FOR SSC PROJECTS – N/A**
**TABLE 10 ADDITIONAL REQUIREMENTS FOR AR PROJECTS – N/A**
**TABLE 11 ADDITIONAL REQUIREMENTS FOR SSC AR PROJECTS – N/A**
**TABLE 12 ADDITIONAL INFORMATION TO BE VERIFIED BY LOCAL ASSESSORS / SITE VISIT**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
Verify operation license from ANEEL (National energy agency) for each plant. Check if the PDD information can be confirmed with the specification described in the licenses.	DR	DR	Linha 3 Leste SHP (14,33MW relating to total capacity), license ANEEL N° 6, 7 January 2004. Caraguatá SHP, license ANEEL N° 656, 23 October 2002. Cascata das Andorinhas SHP, N° 492, 24 July 2001.	Ok	Ok
Verify PPA (Power purchase agreement) for each plant.	DR	DR	There is no PPA. The energy has been sold to the cooperative members.	Ok	Ok
Verify evidences of the starting date of the SHPs.	DR	DR/ site	It was verified operation license that prove the	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
		visit	starting date. Caraguatá SHP: 15 <sup>th</sup> December 2004; Linha 3 Leste SHP: 22 <sup>nd</sup> December 2003. Cascata das Andorinhas SHP: 15th July 2003.		
Verify reservoir area (they comply with the PDD information and with the environmental licenses?).	DR	DR/ site visit	During site visit was verified reservoir area and copy of the maps was provided. Caraguatá SHP: 1,1ha. Linha 3 Leste SHP: 130,6ha. Cascata das Andorinhas 0 (run-of-river).	Ok	Ok
Verify project installed as described in the PDD.	DR	Site visit	Verified the equipments, turbines, generators, and meters.	Ok	Ok
Verify Social contract of the Cooperatives.	DR	DR	It was verified each social contract (copy was provided). Ref.13.	Ok	Ok

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### Annex 3 - FINDINGS OVERVIEW

#### Findings from validation of Rio grande do sul cooperatives small hydro power plants – cdm.val0818

Each Table below represents a finding from the validation assessment. The findings are numbered consecutively, approximately in the order that they have been identified.

Description of table:

Type	Findings are either New Information Requests (NIR) or Corrective Action Requests (CAR). CARs are items that must be addressed before a project can receive a recommendation for registration. NIRs may lead to the raising of CARs. Observations are included at the end and may or may not be addressed. They are primarily to act as signposts for the verifying DOE.
Issue	Details the content of the finding
Ref	refers to the item number in the Validation Protocol
Response	Please insert response to finding, starting with the date of entry.

Rows for comments and further response will be appended to the table until the Findings has been addressed to the satisfaction of the Lead Assessor.

Please note that this is an open list and more findings may be added as validation progresses.

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
1	CAR	The table with gases included in the project boundary was presented in section B.4 of the PDD. The correct is to present the table in section B.3.	1.6/8.1.1
Date: 03/11/2006 [Comments] Correction made. PDD version number 03.			
Date: 04/12/2006 – Fabian Gonçalves. [Acceptance and close out] The revised PDD presents the information “gases included in the project boundary” in the section B.3. CAR 1 was close out.			

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
2	CAR	The PDD do not present information under sub-step 4a.  The step 0 is not applicable because this project is not requiring retroactive credits, but it is necessary to provide an analysis which is similar to step 0 of the additionality tool. The three plants started operation in 2003 and 2004. To provide evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.	3.1
Date: 03/11/2006 [Comments] sub-step 4a was added at PDD version number 02. Step 0 evidence. There is a Minute of Meeting from the Federation of Cooperatives at Rio Grande do Sul, dated 24 July 2004, where was discussed about the contract of a company to do viability study of CDM projects. Although meeting date is after operation start, one can realize that the studies started even before, to culminate in the company contract. Included at PDD version number 02.			
Date:10/12/2006 – Geisa Principe/Fabian Gonçalves. [Acceptance and close out] During site visit were provided three Minutes of Meeting held by the Federation on June 17 <sup>th</sup> 2003 (Ceriluz and Ceral SHPs) and July 20 <sup>th</sup> 2004 (Cooperluz) which evidence the discussion about CDM projects in the cooperatives activities. CAR 2 was close out.			

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
3	NIR	The explanation about the investment barrier is not complete. To present the worksheet with IRR. Provide specific source of the graphics presented in the PDD to confirm the data (Figures 5, 6, 7, 8, 9).	3.2
Date: 03/11/2006 [Comments] <ul style="list-style-type: none"> <li>- Worksheet with IRR sent by email to SGS at November,01 2006. As data were different from that described at PDD version 01, it was altered at PDD version 02.</li> <li>- Figures 5 reference is: BNDES (2000). O setor elétrico – Desempenho 1993/1999. Banco Nacional de Desenvolvimento Econômico e Social. Informe Infra-estrutura, nº 53. <a href="http://www.bndes.gov.br/">http://www.bndes.gov.br/</a>.</li> <li>- Figures 6,7,8,9 reference: Esparta, A. R. J. (2005) Orientation for study and project of Small Hydro Powers (in Portuguese). Document presented to Doctor Qualification. Escola Politécnica da Universidade de São Paulo.</li> </ul>			

- References included in PDD version 02.

Date:10/12/2006 –Geisa Principe/Fabian Gonçalves.

[Acceptance and close out] It was provided copy of the financial analysis. Verified the investment barrier: Internal Rate of Return -7.49% for Cascatas das Andorinhas, 6.23% for Caraguatá and 14.57% for Linha Três Leste. Comparing to SELIC rate of 25% during end 2002 and 2003, the financial IRR is lower. Although the project activity is less profitable than Brazilian government bonds. Project sponsors chose to invest in the power plant because, they are farmer cooperatives and to ensure electricity supply in case of lack in the interconnected grid (problems with energy supplier).

It was verified that the plants are located in a region isolated and lack of infrastructure is a barrier due to the distance from cities, suppliers, roads, communication.

There is no qualified personnel in the region; operators were trained (verified during site visit and copy of the certificates were provided). Ref 5

All data and references presented in the PDD were confirmed.

NIR 3 was close out.

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
4	CAR	Section B.6.2 of the PDD presents the parameters available at validation. The table with EF is not according to the template, and EF build margin, lambda and Area do not present the “Justification of the choice of data...”	4.2

Date: 03/11/2006

[Comments]

Table of EF reviewed according to template.

“Justification of the choice of data” included in PDD version 02.

Date: 10/12/2006 – Geisa Principe/Fabian Gonçalves.

[Acceptance and close out] The PDD was revised and the “justification of the choice of data...” was included. CAR 4 was close out.

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
5	NIR	The cooperatives are responsible for training the staff in the appropriate monitoring, but there is no procedure identified for training and monitoring personnel.	5.2.3

Date: 22/11/2006

[Comments] Procedure sent to DOE by email.

Date:10/12/2006 – Geisa Principe/Fabian Gonçalves.

[Acceptance and close out] Verified the training certificate of the operators and the Operation and Maintenance Manual. Copy was provided. NIR 5 was close out.

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
6	NIR	There are no procedures for other potential emergencies.	5.2.4

Date: 22/11/2006

[Comments] Procedure sent to DOE by email.

Date: 10/12/2006 – Geisa Principe/Fabian Gonçalves.

[Acceptance and close out] Procedures for potential emergencies:

CARAGUATÁ SHP: “Procedimento de monitoramento de geração de energia (energy generation

procedure)".

USINA 3 LESTE SHP: "Procedimentos de monitoramento da geração de energia Usina Três Leste (Energy generation procedure)".

CASCATA DAS ANDORINHAS SHP: "Manual de procedimentos para operação da CGH Cascata das Andorinhas (Energy generation procedure)".

NIR 6 was close out.

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
7	NIR	The PDD mention that manufacturer is responsible for the calibration and maintenance. To present the procedure, certificate and calibration periodicity.	5.2.5

Date: 22/11/2006

[Comments] Procedure sent to DOE by email.

Date: 05/12/2006 – Geisa Principe/Fabian Gonçalves.

[Acceptance and close out] Verified the procedures for meters calibration. Each energy distribution will be responsible for the calibration and maintenance.

#### Usina 3 Leste SHP

Meter: ELO 2180, serial number 90001699, 115V, 10<sup>a</sup> – 60Hz.

ELO calibration certificate, 30/03/2004, periodicity 5 years.

Meter: ELO2180, serial number 90001606, 115V, 10A-60Hz.

ELO calibration certificate, 09/07/2003, periodicity 5 years.

#### Usina 3 Leste SHP

Meter: ELSTER, A3RBR, serial number 5000549, 120V, 2,5A-60Hz.

ELSTER calibration certificate, 28/11/2006, periodicity 5 years.

#### CARAGUATÁ SHP

Meter: COMAP INTELIGEN, 033470A serial number.

COMAP calibration certificate, 09/03/2004, periodicity 10 years.

#### CASCATA DAS ANDORINHAS SHP:

Meter: Nansen, Spectrum SDAT R model, 00131449 and 00131450 serial numbers, 240V, 2, 5 A – 60Hz.

Nansen calibration certificate, 16/09/2006.

Calibration is not necessary during lifetime of the meter (15 years, defined by meter manufacturer).

NIR 7 was close out.

Date: 25/10/2006

Raised by: Fabian Gonçalves

No.	Type	Issue	Ref
8	CAR	This project involves three small hydro plants. The PDD mention that maintenance, monitoring, measurements, records handling, review of reported results, internal audits, adjustments and uncertainties is under Cooperatives responsibility. To present the procedures implemented in each SHP. The plants need to follow the same monitoring plan to comply with ACM0002 methodology and PDD requirements.	5.2.6

Date: 22/11/2006

[Comments] Procedure sent to DOE by email.

Date: 10/12/2006 – Geisa Principe/Fabian Gonçalves.

[Acceptance and close out] It was verified the procedure (copy was provided) for each plant. Each cooperative is responsible for the calibration, maintenance of the monitoring equipment, measurements, records of documentation, as well as for data collection and archiving, for monitoring data adjustments, and uncertainties, for review of results/data, internal audit and for corrective actions. (see Annex 4 of the PDD).

CAR 8 was close out.

Observations:

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