




**Verification and certification report form for
CDM project activities
(Version 02.1)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Teles Pires Hydropower Plant Project Activity 9301
Version number of the verification and certification report	2.0Aa
Completion date of the verification and certification report	29/03/2019
Monitoring period number and duration of this monitoring period	07/11/2015 to 31/01/2017
Version number of the monitoring report to which this report applies	Version 5.1
Crediting period of the project activity corresponding to this monitoring period	07/11/2015 to 06/11/2025 (fixed)
Project participants	Companhia Hidrelétrica Teles Pires Ecopart Assessoria em Negócios Empresariais Ltda.
Host Party	Brazil
Applied methodologies and standardized baselines	ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012
Mandatory sectoral scopes linked to the applied methodologies	Sectoral scope 1: Energy industries
Conditional sectoral scope(s) linked to the applied methodologies	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	3,128,649
Certified amount of GHG emission reductions or GHG removals for this monitoring period	1,473,640 tCO ₂ e
Name and UNFCCC reference number of the DOE	RINA Services S.p.A. (RINA), E-0037
Name, position and signature of the approver of the verification and certification report	<p>Laura Severino (Authorized officer signing for the DOE)</p> <p>Head of Sustainability & Food Certification Compliance Unit</p> 

SECTION A. Executive summary

>> RINA Services S.p.A. (RINA), commissioned by Companhia Hidrelétrica Teles Pires, has verified the greenhouse gas emission reductions reported for the project activity “Teles Pires Hydropower Plant Project Activity” in Brazil, CDM Registration Reference N° 9301, for the period 07/11/2015 to 31/01/2017, with regard to the relevant requirements for CDM activities. The project was validated by PERRY JOHNSON REGISTRARS CARBON EMISSIONS SERVICES, INC (validation report C-1-B-01-L-0222-VA version 3.2 dated 24/12/2012) and it was registered on 28/12/2012 (Date of registration action 11/07/2013) under the CDM registration reference N° 9301.

The GHG emission reductions were calculated on the basis of the approved methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012 and the monitoring plan included in the registered Project Design Document, version 07 of 04/10/2012.

The purpose of the project activity is to generate electricity through renewable energy generation (Greenfield hydropower plant) and it is connected to the national grid (SIN from the Portuguese Sistema Nacional Interligado).

Scope of verification

Verification is the periodic independent review and ex-post determination by a DOE of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period. Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The verification scope is to verify that:

- The project activity has been implemented and operated in accordance with the registered PDD;
- the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- the GHG emission reduction data and calculation have been assessed to correctly support the emission reductions being claimed and that the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence.

Verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable UNFCCC criteria for CDM in order to be certified.

Verification process.

Verification was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The verification consisted of the following three phases:

- Desk review;
- On-site assessment;
- The resolution of outstanding issues and the issuance of the final verification report and certification.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

Conclusion

RINA Services S.p.A. (RINA), commissioned by Companhia Hidrelétrica Teles Pires, verified the greenhouse gas emission reductions reported for the project activity “Teles Pires Hydropower Plant Project Activity” in Brazil, CDM Registration Reference N° 9301, for the period 07/11/2015 to 31/01/2017, with regard to the relevant requirements for CDM activities. In conclusion, it is RINA’s opinion that the project activity Teles Pires Hydropower Plant Project Activity, in Brazil, as described in the Monitoring Report version 5.1 of 15/03/2019, meets all relevant requirements for CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012. In our opinion the GHG emission reductions reported for the project in the monitoring report are fairly stated.

On 30/01/2019 an incompleteness check was received. The verification report, monitoring report and Validation report form for post-registration changes for CDM project activities is submitted to address the issues raised.

1:

The MR has mentioned that following changes have been observed in the technical specifications of the implemented project compared to the PDD.

(a) Change in the reservoir water level from 220m to 220.4m resulting in an increase in the reservoir area from 134.7km² to 146.5km².

(b) Change in the installed capacity from 1820MW to 1820.025MW.

(c) Change in turbine capacity from 369.7MW to 370.10MW.

(d) Change in calibration frequency from 2 years to 5 years.

The MR further mentions that as changes are not material and do not impact additionality, the PP did not consider it necessary to revise the PDD. However, as per paragraph 230 of the CDM project standard for the project activities if there is any change to the implementation, operation or monitoring of the registered PDD, the PP shall prepare a revised PDD. The PP shall provide more information how it considered it complies with this requirement of the project standard.

RINA response: A revised PDD Version 7.1 of 15/03/2019 and Validation report form for post-registration changes for CDM project activities are submitted with the current verification. Changes were updated in the monitoring report version 5.1 of 15/03/2019

2:

The DOE verified that the technology, project equipment and monitoring and metering equipment is implemented and operational in accordance with the registered PDD, however the monitoring report identifies changes in project implementation and monitoring compared to the PDD. The DOE shall provide information how it verified that the project implementation and monitoring is in accordance with the registered PDD and the reasons for not identifying them as post registration changes.

RINA response: A revised PDD Version 7.1 of 15/03/2019 and Validation report form for post-registration changes for CDM project activities are submitted with the current verification. Changes were updated in the monitoring report version 5.1 of 15/03/2019

3:

The DOE shall provide its assessment of global stakeholder consultation in section D.10 of the verification report, including all relevant information related to the global stakeholder consultation required to be conducted after the publication of the first monitoring report in accordance with the "CDM project cycle procedure for project activities . Please refer para 394 of the CDM validation and verification standard for project activities version 01.

RINA response: Section D.10 of the verification report was updated to describe that no comments were received.

SECTION B. Verification team, technical reviewer and approver**B.1. Verification team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader/ Verifier/ Technical Expert TA 1.2	IR	Carvalho	Thais	RINA Brazil	x	x	x	x

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Liu	Hui Feng	RINA China
2.	Approver	IR	Severino	Laura	RINA HQ

SECTION C. Application of materiality**C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	The qualification and capability of the human resource	Low	Personnel qualified to monitor the project activity. Procedure available.	Interview personnel during the onsite visit
2	Raw data collection, transfer and storage process	Medium	Data is automatically measure and transferred manually from the energy meters registers to the CERs spreadsheet. Errors in the data transference have direct impact in the CERs calculation	Check all the inputs for energy measurements
3	Measuring and recording method	Low	Data is measured and recorded automatically by energy meters	Check all the inputs for the energy measurements
4	Calibration records for electricity meters	Low	Calibration is conducted in accordance with National requirements	Check calibration certificates
5	Metering records	Low	Data is measured by sealed meters located at substation	Check all the inputs for the energy measurements and cross check CCEE reports

C.2. Consideration of materiality in conducting the verification

>>In accordance with the VVS, paragraph 361 the threshold applied for the project activity is (a) 0.5 per cent of the emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year.

An onsite inspection has been performed on 30-31/10/2017 and it is confirmed that the monitoring arrangements in the monitoring plan are feasible within the project design. The monitoring is based only on data measured.

The CERs calculation /07/ is based only in data obtained through the monitoring. The data presented in the monitoring report /02/ were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Verified during the onsite visit, that the roles and responsibilities are in accordance with the registered PDD. Therefore, it is RINA's opinion that the claimed emission reductions are free from material errors, omissions or misstatements, with reasonable level of assurance

SECTION D. Means of verification

D.1. Desk/document review

>> The monitoring report, version 5.1 of 15/03/2019 and previous version /02/, the emission reduction calculations provided in the form of a spreadsheet, "CHTP_CERs_v.5_2018.12.11.xlsx" version 5 of 11/12/2018 and previous versions /07/, were assessed as part of the verification. In addition the registered Project Design Document (PDD) and revised PDD Version 7.1 of 15/03/2019 /01/ in particular the baseline estimations and the monitoring plan and the validation report number C-1-B-01-L-0222-VA, version 3.2 dated 24/12/2012 /11/ for the project were reviewed.

The monitoring report version 01 of 29/08/2017 /02/ was made publicly available on the CDM UNFCCC website on 04/09/2017. The Appendix 3 lists the documentation that was reviewed during the verification.

D.2. On-site inspection

Duration of on-site inspection:				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and operation of the proposed project activity. Checked the monitoring equipment, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant	Teles Pires hydropower plant	30/10/2017	Thaís Carvalho
2.	Reviewed the information flows for generating, aggregating and reporting the monitoring parameters	Teles Pires hydropower plant	30/10/2017	Thaís Carvalho
3.	Checked calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions	Teles Pires hydropower plant	30/10/2017	Thaís Carvalho
4.	Checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Teles Pires hydropower plant	30/10/2017	Thaís Carvalho
5.	Cross-checked between information provided in the monitoring report and data evidence	Teles Pires hydropower plant	30/10/2017	Thaís Carvalho

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Loiola	Arthur	CHTP	30/10/2017	Environmental analyst: project implementation, project operation	Thaís Carvalho
2	Duarte	Marcos	CHTP	30/10/2017	DMA: project implementation, project operation	Thaís Carvalho
3	Gonçalves	Muller	CHTP	30/10/2017	O&M Manager: project implementation, project operation, energy measurements, calibration,	Thaís Carvalho
4	Giribola	Priscila	CHTP	30/10/2017	Analyst: project implementation, project operation, energy	Thaís Carvalho
5	Esparta	A. Ricardo	Eqao	30/10/2017	Technical analyst: MR, CERs calculation, emission factor data	Thaís Carvalho
6	Cunha	Gilson	CHTP	30/10/2017	Operational Technician: equipments	Thaís Carvalho

					installed, project operation, energy meters	
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D.4. Sampling approach

>>N/A

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form			
Compliance of the project implementation and operation with the registered PDD		2	
Post-registration changes		1	
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan	1	4	
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals			
Assessment of reported sustainable development co-benefits	1		
Global stakeholder consultation			
Others (please specify)			
Total	2	8	

SECTION E. Verification findings**E.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	The monitoring report /02/ submitted by the PP has been the basis for starting the verification process. RINA confirms that the Monitoring report is based on the currently valid MR template and complies with "Instructions for completing this form /08/.
Findings	N/A
Conclusion	RINA verified that the monitoring report was completed in accordance with the CDM-MR-FORM - Monitoring report form, including its Instructions for completing this form, version 6.0 /08/

E.2. Remaining forward action requests from validation and/or previous verifications

>>N/A

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	Rina verified during the on-site visit that the following equipment's are installed and operational: Generators (5 units) Manufacturer: Voith Type: 1DH89533WF48-Z Power: 404,450 kVA
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	<p>Potency factor: 0.90 Factory numbers: SP.11.00926295.01; SP.11.00926295.02; SP.11.00926295.03; SP.11.00926295.04; SP.11.00926295.05</p> <p>Turbines (5 units): Manufacturer: Alstom Type: Francis Nominal Power: 370.1 MW Nominal flow: 783.87 m³/s</p> <p>RINA verified that the installed capacity of the project activity is correctly described and monitored (parameter CAP_{PJ}) in accordance with ACM0002 requirements.</p> <p>PP has provided the following ANEEL Ordinances to authorize the operation start up of the units: - ANEEL Ordinance n° 3646 from 06/11/2015, authorizing the startup of generation unit 1 on 07/11/2015 /12/ - ANEEL Ordinance n° 4151 from 29/12/2015, authorizing the startup of generation unit 2 on 30/12/2015 /13/ - ANEEL Ordinance n° 2103 from 03/08/2016, authorizing the startup of generation unit 3, 4 and 5 on 04/08/2016 /14/</p>
Findings	<p>CAR 1: Verified during the onsite visit that the installed turbines are different from the description in the registered PDD. Moreover, considering the power in kVA and potency factor of the generators, the total installed capacity of the generators is not considering the decimals (1820.025 MW of installed capacity). Provisions of the CDM project standard for project activities were not taken into account. To close CAR 1 the installed capacity with decimal places (= 1820.025 MW) is considered in the revised MR and monitored parameter CAP_{PJ}</p> <p>CAR 2: MR did not include the Description of the installed technology, technical processes and equipment; and information on the implementation and actual operation of the project activity, including relevant dates (e.g. construction, commissioning, start of operation), as requested in the Instructions for completing the CDM-MR-FORM. To close CAR 2, revised MR was completed in accordance with the Instructions for completing the CDM-MR-FORM</p>
Conclusion	<p>It is RINA's opinion, based on the site visit, that technology, project equipment and monitoring and metering equipment is implemented and operational in accordance with the registered PDD /01/</p>

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

>>N/A

E.4.2. Corrections

>>N/A

E.4.3. Change to the start date of the crediting period of the project activity

>> RINA verified in the UNFCCC project page that the crediting period has changed from 01/01/2015-31/12/2024 to 07/11/2015 -06/11/2025.

E.4.4. Inclusion of a monitoring plan

>>N/A

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools

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(c) Changes that are being submitted with this monitoring report as part of the request for issuance (post-registration changes - issuance track) as applicable from this monitoring period.

1. Calibration frequency: registered PDD indicated 2-year calibration period based on applicable ONS procedures at the time. According to the updated ONS procedures, valid from 01/01/2017 onwards, energy meter calibration shall be done in a 5-year period. Please, refer to the validation report on PRC.

E.4.6. Changes to the project design

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(c) Changes that are being submitted with this monitoring report as part of the request for issuance (post-registration changes - issuance track) as applicable from this monitoring period.

1. Reservoir water level: it changed from 220m to 220.40 m, affecting reservoir area, which increased from 134.7km² to 146.50km².

2. Installed capacity: While considering generators tag, the resulted installed capacity is 1,820.025 MW: 404,450 kVA x 0.9 = 364,005 kW x 5 generating units = 1,820.025 MW (instead of 1820 MW).

3. Turbine capacity: it changed from 369.7 MW to 370.10MW each. Please, refer to the validation report on PRC.

E.4.7. Changes specific to afforestation and reforestation project activities

>>N/A

E.5. Compliance of the registered monitoring plan with the methodology including applicable tools and standardized baselines

Means of verification	The project applies the approved methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012 /06/; the emission factor is calculated provided by the Brazilian DNA, calculated using the "Tool to calculate the emission factor for an electricity system" /10/.
Findings	N/A
Conclusion	The monitoring plan in the registered/revised PDD /01/ is in accordance with the monitoring methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012 /06/ including the applicable tool /10/.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	The parameter available at the validation stage, which do not need to monitor during the crediting period, as per the registered PDD are:		
	DATA/PARAMETER Unit	Reported value for the project period	Source of data/ Assessment/Observation
	W_{OM} (fraction) weighting	0.5	Defined in the Tool to calculate the emission factor for an electricity system /10/
	W_{BM} (fraction)	0.5	Defined in the Tool to calculate the

	weighting		emission factor for an electricity system /10/
	$EF_{grid, BM,y}$ (tCO _{2e} /MWh): CO ₂ Grid Build Margin.	0.1404	The parameter was used to calculate ex ante the emission factor of the grid data from 2010, provided by the Brazilian DNA /1/. Value applied for the CERs calculation is in accordance with data in the registered PDD /01/.
	Cap_{BL} (W) Installed capacity of the hydropower plant before the implementation of the project activity	0	Value defined in accordance with the methodology for new hydropower plants.
	A_{BL} (m ²) Area of the single or multiple reservoirs measured in surface of the water, before the implementation of the project activity, when the reservoir is full.	0	Value defined in accordance with the methodology for new hydropower plants.
Findings	N/A		
Conclusion	Data and parameters fixed ex-ante are in accordance with the registered PDD /01/		

E.6.2. Data and parameters monitored

Means of verification	The parameter following parameters shall be monitored in accordance with the registered PDD /01/:		
	Parameter	$EG_{facility,y}$	
	Data Unit	MWh/yr	
	Description	Quantity of net electricity generation supplied by the project plant to the grid in year y	
	Source of data to be used	Energy meters	
	Value of monitored parameter for the monitoring period	2015: 126,457 2016: 2,962,165 2017: 899,515 Total: 3,988,138 RINA has cross check the net energy delivered to grid, considering the official values for the energy delivered to the grid confirmed by CCEE (gross energy) /27/ and the invoices for the energy consumed from the grid /29/. RINA has also confirmed that the CCEE values are conservative when compared to the energy measurements /28/	
	Monitoring equipment	Verified during the onsite visit that the energy meters are sealed, located in the local substation Paranaíta.	
	Accuracy of the monitoring equipment	0.2, in accordance with National requirements /30/	
	Measuring / Reading/ Recording	Continuous measurement and at least monthly recording. RINA verified during the onsite visit, that it is continuously measured and hourly values are available.	

	frequency				
	Parameter	EF_{grid,OM,y}			
	Data Unit	tCO2/MWh			
	Description	Grid operating margin			
	Source of data to be used	Brazilian Designated National Authority			
	Value of monitored parameter for the monitoring period	2015: 0.5538 2016: 0.6189 2017: 0.5381			
	Monitoring equipment	Not applicable, data is provided by the Brazilian DNA			
	Accuracy of the monitoring equipment	Not applicable, data is provided by the Brazilian DNA			
	Measuring/Reading/Recording frequency	Hourly, since the project applies the Dispatch data analysis OM			
	Parameter	Cap_{PJ}			
	Data Unit	MW			
	Description	Installed capacity of the hydropower plant after the implementation of the project activity			
	Source of data to be used	Project site			
	Value of monitored parameter for the monitoring period	1,820.025 Cross check: RINA has confirmed the installed capacity of the project activity in the generator's name plate.			
	Monitoring equipment	Information is described in the generator's tag (nameplate)			
	Accuracy of the monitoring equipment	Not applicable			
	Measuring/Reading/Recording frequency	yearly			
	Parameter	A_{PJ}			
	Data Unit	Km ²			
	Description	Area of the reservoir measured on the surface of the water, after the implementation of the project activity			
	Source of data to be used	Project developer			
	Value of monitored parameter	Year	Water Level (m)	A _{PJ}	
		2015	220.43	146.2	

	for the monitoring period	2016	220.33	143.6	
		2017	220.44	146.5	
		Cross check: PP has provided the water level measurements /15/ and the ANEEL technical sheet /21/ and executive project report /22/			
	Monitoring equipment	Water level measured with electronic devices and compared to topographical studies from project design.			
	Accuracy of the monitoring equipment	Not applicable			
	Measuring/ Reading/ Recording frequency	RINA verified that data is monthly consolidated from daily measurements.			
Findings	<p>CL 1: PP is requested to provide the evidences from CCEE to cross check the amount of energy delivered by the project activity to the grid (net energy). OBS: PP has provided the cross check of the gross energy. To close CL 1 documents were revised in accordance with the evidences for the energy consumed from the grid.</p> <p>CAR 4: In accordance with registered PDD and methodology ACM0002: (i) the quantity of electricity supplied by the project plant/unit to the grid and (ii) the quantity of electricity delivered to the project plant/unit from the grid shall be monitored. RINA verified that the MR is not considering the quantity of electricity delivered to the project activity. To close CAR 4 documents were revised in accordance with the evidences for the energy delivered to the grid and energy consumed from the grid.</p> <p>CAR 5: In the CERs spreadsheet, the sum of hourly energy supplied to the grid used in the calculations of the emission factor (sheets "Emission factor") is not in accordance with the net energy used to calculate the CERs. To close CAR 5 documents were revised in accordance with the evidences,</p> <p>CAR 6: It is not provided in the monitoring equipment row the information on type, accuracy class, serial number, calibration frequency, date of calibration and validity in accordance with the Instructions for completing the CDM-MR-FORM. To close CAR 6, MR was revised in accordance with the instructions.</p> <p>CAR 7: The meters described in the section C of the monitoring report, does not reflect all meters applicable to the monitoring period. To close CAR 7, meters applicable to the monitoring period were revised in accordance with the evidences.</p> <p>CAR 8: Verified during the onsite visit that the water level was updated during the project implementation (220.44 m) and reservoir area (146.5 km²). Updated information is not considered, taking into account the provisions of project standard. To close CAR 8, MR was revised in accordance with the evidences and ACM0002 requirements to monitored the parameter A_{PJ}.</p>				
Conclusion	<p>RINA confirms:</p> <ul style="list-style-type: none"> - That all the parameters stated in the registered PDD have been monitored; - The responsibilities and authorities for monitoring and reporting are in accordance with those stated in the registered PDD - The monitoring results are consistently recorded as per the approved frequency - Quality assurance and quality control procedure have been applied in accordance with the registered/revised PDD. 				

E.6.3. Implementation of sampling plan

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	<p>Verified the following calibration certificates applicable to the monitoring period: PT-1212A173-01 (LT1 main meter, procedure resumed on 12/07/2016 /23/): Calibration certificate number 2015-463, for the energy meter PT-1212A173-01, calibration performed on 30/09/2015 /19/</p> <p>MW-1602A158-02 (LT1 main meter-installed to replace the meter PT-1212A173-01 procedure resumed on 12/07/2016 /23 and confirmed at the time of onsite visit) Factory calibration certificate for the energy meter serial number MW-1602A158-02, factory calibration certification 09/02/2016 /24/ and calibration on 20/03/2016, report dated 22/03/2016 /25/</p> <p>(RINA verified that both meters have calibration certificates valid during the corrective period that replaced meter PT-1212A173-01 by MW-1602A158-02)</p> <p>MT-1306A028-01 (LT1 Backup meter-installed at the time of onsite visit) - Calibration certificate number 2015-464, for the energy meter MT-1306A028-01, calibration performed on 30/09/2015 /18/</p> <p>PT-1212A059-01 (LT2 Main meter, operational until 19/10/2017 /16/) - Calibration certificate number 2015-465, for the energy meter PT-1212A059-01, calibration performed on 30/09/2015 /20/</p> <p>PT-121A044-01 (LT2 Backup meter) - Calibration certificate number 2015-466, for the energy meter PT-121A044-01, calibration performed on 30/09/2015 /17/</p> <p>(Observation: Equipment installed at the time of onsite visit MW-1611A979-02 for LT2 Main meter, installed on 19/10/2017) /16/- not applicable to the monitoring period.)</p> <p>The calibration of the energy meters followed the national requirements of ONS grid Procedures. /30/</p>
Findings	N/A
Conclusion	It is RINA's opinion that the calibration of energy meters applicable to the project activity followed the frequency described in the registered PDD and are valid for the monitoring period.

E.8. Assessment of data and calculation of emission reductions or net removals**E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks**

Means of verification	<p>According to the applied methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012 /06/, the baseline emissions (BE_y) are calculated as follow</p> $BE_y = EG_{pj,y} \times EF_{grid,CM,y}$ <p>Where,</p> <p>BE_y = Baseline emissions, in tCO₂/yr;</p> <p>EG_{pj,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)</p> <p>EF_{grid,CM,y} = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate</p>
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the emission factor for an electricity system" (tCO₂/MWh) /10/

The project activity is the installation of a new grid connected renewable power plant where no renewable power plant was operated prior the implementation of the project activity, therefore,

$$EG_{pj,y} = EG_{facility,y}$$

$EG_{pj,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).

$EG_{facility,y}$ 2015= 126,457 MWh/yr; 2016= 2,962,165 MWh/yr and 899,515 MWh/yr, summing the total for the monitoring period 3,988,138 MWh/yr.

Determination of $EF_{grid,CM,y}$

STEP 1: Identify the relevant electricity system

The Brazilian DNA published a Resolution #08, issued on 26th May, 2008, defines the National Interconnected Grid (SIN) as a single system that covers all the five macro-geographical regions of the country (North, Northeast, South, Southeast and Midwest) /36/

STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional)

The Brazilian DNA is responsible for calculating the emission factors and it did not include off-grid power plants in the calculation, therefore Option I is used: Only grid power plants are included in the calculation;

STEP 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is calculated by the Brazilian DNA based on the option (c) dispatch data analysis OM

Step 4: Calculate the operating margin emission factor according to the selected method

$$EF_{grid,OM-DD,y} = \frac{\sum_m EG_{PJ,h} \times EF_{EL,DD,h}}{EG_{PJ,y}}$$

Where:

$EF_{grid,OM-DD,y}$ = Dispatch data analysis operating margin CO₂ emission factor in year y (tCO₂/MWh)

$EG_{PJ,h}$ = Electricity displaced by the project activity in hour h m of year y (MWh)

$EF_{EL,DD,h}$ = CO₂ emission factor for power units in the top of the dispatch order in hour h in year y (tCO₂/MWh)

$EG_{PJ,y}$ = Total electricity displaced by the project activity in year y (MWh)

h = hours in year y in which the project activity is displacing grid electricity

y = Year in which the project activity is displacing grid electricity

Based on hourly CO₂ emission factor of the grid published by the Brazilian DNA and UHE Teles Pires hourly electricity generation, the OM_{EF} is calculated.

STEP 5 - Calculate the build margin (BM) emission factor

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where,

$EF_{grid,BM,y}$ = Build margin CO2 emission factor in year y (t CO2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$EF_{EL,m}$ = CO2 emission factor of power unit m in year y (t CO2/MWh)

m = Power units included in the build margin

y = Most recent historical year for which electricity generation data is available

For data vintage, Option 1 (ex-ante) was chosen for the proposed project in the first crediting period, data fixed in the registered PDD is equal 0.1404 tCO2e/MWh

STEP 6 – Calculate the combined margin (CM) emissions factor

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot W_{OM} + EF_{grid,BM,y} \cdot W_{BM}$$

According with the Tool, values adopted for W_{OM} and W_{BM} were equal to 0.50 and 0.50, respectively.

The combined emission factor is:

Year	$EF_{grid,OM}$ (tCO ₂ /MWh)	$EF_{grid,BM}$ (tCO ₂ /MWh)	$EF_{grid,CM}$ (tCO ₂ /MWh)
2015	0.5538	0.1404	0.3471
2016	0.6189	0.1404	0.3796
2017	0.5381	0.1404	0.3393

Findings

Pending **CAR 4** and **CAR 5**. CARs were correctly addressed.

Conclusion

RINA verified that the baseline emissions were calculated in accordance with the formulae and methods described in the registered/revised PDD, the applied methodology and methodological tool.

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	<p>In accordance with the methodology, $PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$ Where: PE_y = Project emissions in year y (tCO₂e/yr) $PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO₂/yr) $PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO₂e/yr) $PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)</p> <p>In accordance with the methodology $PE_{FF,y}$ and $PE_{GP,y}$ are considered zero for hydropower plants.</p> <p>Emissions from water reservoirs of hydro power plants ($PE_{HP,y}$) $PE_{HP,y} = EF_{Res} \times TEG_y / 1000$</p> <p>Where: $PE_{HP,y}$ = Project emissions from water reservoirs (tCO₂e/yr) EF_{Res} = Default emission factor for emissions from reservoirs of hydro power plants in year y (kgCO₂e/MWh)</p>
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	<p>TEG_y = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)</p> <p>The power density of the project activity (PD) is calculated as follows:</p> $PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$ <p>Where:</p> <p>PD = Power density of the project activity (W/m²)</p> <p>Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)</p> <p>Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero</p> <p>A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)</p> <p>A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero.</p> $PD = \frac{1820.025 - 0}{146.50 - 0} = 12.42 \text{ W/m}^2,$ <p>(Conservatively, considering the year 2017, with larger reservoir area)</p> <p>Therefore, project emissions does not need to be accounted for the project activity, in accordance with the applied methodology.</p>
Findings	CL 2: PP is requested to update the calculation of the power density in accordance with the current installed capacity and reservoir area of the project activity. To close CL 2, power density was correctly revised.
Conclusion	RINA verified that the project emissions were calculated in accordance with the formulae and methods described in the registered/revised PDD and the applied methodology.

E.8.3. Calculation of leakage GHG emissions

Means of verification	In accordance with the applied methodology Leakage is zero.
Findings	N/A
Conclusion	Leakage was considered zero in accordance with the applied methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>According to the applied methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012 /06/, the emission reductions have been calculated based on the following formula:</p> $ER_y = BE_y - PE_y$ <p>Where,</p> <p>ER_y = Emission reductions in year y (tCO₂e/yr)</p> <p>BE_y = Baseline emissions in year y (tCO₂/yr)</p> <p>PE_y = Project emissions in year y (tCO₂e/yr)</p> <p>In accordance with the registered PDD and applied methodology, project emissions (PE_y) and leakage (LE_y) is zero. Therefore, ER_y = BE_y</p> <p>The emission reductions from the project for the monitoring period is 1,473,640 tCO₂e. The CERs calculation is based only on data available. RINA has cross checked all data for the monitoring period. As the monitoring period starts on 01/01/2017, the pro-rata approach is not applicable. As the monitoring period starts on 07/11/2015, the pro-rata approach is not applicable.</p>
Findings	Pending CL 1, CL 2, CAR 4, CAR 5; CLs and CARs were correctly closed (details

	in Appendix 4).
Conclusion	<p>RINA confirms:</p> <ul style="list-style-type: none"> - All the data and parameters were monitored in accordance with the revised PDD - The data reported were cross-checked with the data recorded by PP and the values reported in the MR were verified against the raw data presented by the PP - The calculation of emission reductions have been carried out in accordance with the formulae and methods described in the revised PDD, the applied methodologies and methodological tools; - Emission factor and default values have been applied in the calculation in accordance to the revised PDD.

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	<p>The reported emission reductions are lower than the estimated emission reduction of 3,128,649 tCO₂e for the period as per the registered PDD /01/.</p> <p>The data presented in the monitoring report /02/ were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by RINA for the reported emission reductions as listed in the above sections.</p>
Findings	Pending CL 1, CL 2, CAR 4, CAR 5; CLs and CARs were correctly closed (details in Appendix 4).
Conclusion	Verified during the onsite visit the reported emission reductions are lower than the estimated emission reduction in the registered PDD

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The emission reductions from the project for the monitoring period as reported in the monitoring report version 1 /02/ is equivalent to 1,473,640 tCO ₂ e tCO ₂ e.
Findings	Pending CL 1, CL 2, CAR 4, CAR 5; CLs and CARs were correctly closed (details in Appendix 4).
Conclusion	The emission reductions calculation provided in the spreadsheet have been verified to be correct and in line with the registered PDD.

E.9. Assessment of reported sustainable development co-benefits

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.10. Global stakeholder consultation

Means of verification	No comments were received.
Findings	N/A
Conclusion	No comments were received.

SECTION F. Internal quality control

>> The final draft revision of the verification report before being submitted to request of issuance is subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions.

The technical review is performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

SECTION G. Verification opinion

>> RINA Service Spa (RINA) has performed verification of the emission reductions reported for the project activity Teles Pires Hydropower Plant Project Activity in Brazil, CDM Registration Reference N° 9301, for the period 07/11/2015 to 31/01/2017, with regard to the relevant requirements for CDM activities.

The project activity was correctly implemented according to selected monitoring methodology and monitoring plan. The monitoring equipment was installed, calibrated and maintained in a proper manner, while collected monitoring data are allowed to verify the amount of achieved GHG emission reductions.

In conclusion, it is RINA's opinion that the project activity Teles Pires Hydropower Plant Project Activity, in Brazil, as described in the Monitoring Report version 5.1 of 15/03/2019, meets all relevant requirements for CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012. The verification is conducted in-line with the VVS requirements. Hence RINA is able to issue a positive opinion in accordance with the certificate statement.

SECTION H. Certification statement

>> RINA Service Spa (RINA) has performed verification of the emission reductions reported for the project activity Teles Pires Hydropower Plant Project Activity in Brazil, CDM Registration Reference N° 9301, for the period 07/11/2015 to 31/01/2017, with regard to the relevant requirements for CDM activities.

The project participants of the Teles Pires Hydropower Plant Project Activity project are responsible for:

- the preparation of greenhouses gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the registered project design document PDD

- the development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the requirements of paragraph 62 of the CDM modalities and procedures and on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- the project has been implemented and operated as per the revised PDD; (submitted with the current verification)

- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable CDM requirements;

- the monitoring is in place as per the applied baseline and monitoring methodology;

- the monitoring complies with the monitoring plan in the revised PDD; (submitted with the current verification)

- the monitoring plan in the revised PDD is as per the applied baseline and monitoring methodology.

It is RINA's opinion that the GHG emission reduction stated in the monitoring report version 5.1 of 15/03/2019 for the Teles Pires Hydropower Plant Project Activity in Brazil for the period 07/11/2015 to 31/01/2017 are fairly stated. The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13 of 11/05/2012 and the monitoring plan contained in the registered PDD.

The breakdown of the emission reductions for the monitoring period has also been clearly demonstrated, with emission reduction for second commitment period calculated using the latest GWPs and the following is verified to be correct:

-Actual emission reduction for the monitoring period 07/11/2015 to 31/01/2017: 1,473,640 tCO₂e

Hence RINA is able to certify that the emission reductions from the project during the monitoring period 07/11/2015 to 31/01/2017 amount to 1,473,640 tCO₂e

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification Request
CHTP	Central Hidrelétrica Teles Pires
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Thais DE LIMA CARVALHO

è qualificato come¹:
is qualified as:

CDM -TEC, -VAL, -VER, -TL
ITRP, REG-EXP²

per le seguenti aree tecniche:
for the following technical areas:

1.1, 1.2, 2.1, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal energy generation	1
1.2	Renewables	1
2.1	Electricity distribution	2
13.1	Solid waste and wastewater	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19-08-2009	-
13	31-03-2017	Added qualification as ITRP
14	20-07-2018	Added qualification as REG-EXP

Il Resp. CCPLS
Head of CCPLS

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: Social Carbon Standard
JI: Joint Implementation

² Asia / Central Asia and Pacific region; Africa (Senegal Mali, Niger, Nigeria, Ghana, Togo, Uganda, Angola, Namibia, Mozambique; South America (all countries); Central America (all countries).

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN_07_18

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CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:

Hui Feng LIU

We declare that Mr/Mrs/Ms:

è qualificato come¹:
is qualified as:

CDM -TEC, -VAL, -VER, -TL
ITRP, REG-EXP²

per le seguenti aree tecniche:
for the following technical areas:

1.1, 1.2, 8.1, 9.2, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal energy generation	1
1.2	Renewables	1
8.1	Mining and mineral processes	8
9.2	Iron, steel and ferro-alloy production	9
13.1	Solid waste and wastewater	13

in accordo alle istruzioni dell'unità Sostenibilità & Cambiamenti Climatici.
in accordance with the instructions of the Sustainability & Climate Change Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	10/09/2010	-
11	31/03/2017	Updating qualification as ITRP
12	30/07/2018	Updating qualification as REG-EXP

Il Resp. CCPLS
Head of CCPLS

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: Social Carbon Standard
JI: Joint Implementation

² Asia / Central Asia and Pacific region

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Companhia Hidrelétrica Teles Pires and Ecopart Assessoria em Negócios Empresariais Ltda.	* Registered CDM-PDD for project activity “Teles Pires Hydropower Plant Project Activity” in Brazil	Version 7 of 04/10/2012 Version 7.1 of 15/03/2019	Project participant
2	Companhia Hidrelétrica Teles Pires and Ecopart Assessoria em Negócios Empresariais Ltda.	Monitoring report for project activity “Teles Pires Hydropower Plant Project Activity” in Brazil related to the monitoring period 07/11/2015 to 31/01/2017.	version 01 of 29/08/2017 of version 2 of 04/07/2018 version 3 of 12/09/2018 version 4 of 27/09/2018 version 5 of 11/12/2019 version 5.1 of 15/03/2019	Project participant
3	CDM Executive Board	CDM project cycle procedure for project activities	version 01.0 of 03/03/2017 version 2.0 of 29/11/2018 (applicable to the final report)	Others
4	CDM Executive Board	CDM project standard for project activities	version 01.0 of 03/03/2017 version 2.0 of 29/11/2018 (applicable to the final report)	Others
5	CDM Executive Board	CDM validation and verification standard for project activities	version 01.0 of 03/03/2017 version 2.0 of 29/11/2018 (applicable to the final report)	Others
6	CDM Executive Board	CDM Executive Board: Baseline and monitoring methodology ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources	version 13 of 11/05/2012	Others
7	Companhia Hidrelétrica	CERs spreadsheet “CHTP_CERs_v.1_2017.08.18.xlsx”	version 1 of 18/08/2017	Project participant

	Teles Pires and Ecopart Assessoria em Negócios Empresariais Ltda.	"CHTP_CERs_v.2_2018.06.19.xlsx" "CHTP_CERs_v.3_2018.08.20.xlsx" "CHTP_CERs_v.4_2018.09.27.xlsx" "CHTP_CERs_v.5_2018.12.11.xlsx"	version 2 of 19/06/2018 version 3 of 20/08/2018 version 4 of 27/09/2018 version 5 of 11/12/2018	
8	CDM Executive Board	CDM-MR-FORM - Monitoring report form, including Attachment. Instructions for completing this form	version 6.0	Other
9	CDM Executive Board	Guideline: Application of materiality in verifications	Version 2 of 20/02/2015	Other
10	CDM Executive Board	Tool to calculate the emission factor for an electricity system	02.2.1 of 29/09/2011	Other
11	PERRY JOHNSON REGISTRARS CARBON EMISSIONS SERVICES, INC	Validation report number C-1-B-01-L-0222-VA for the project Teles Pires Hydropower Plant Project Activity	version 3.2 dated 24/12/2012	Other
12	ANEEL	Ordinance nº 3646 from 06/11/2015, authorizing the startup of generation unit 1 on 07/11/2015	06/11/2015	Other
13	ANEEL	Ordinance nº 4151 from 29/12/2015, authorizing the startup of generation unit 2 on 30/12/2015	29/12/2015	Project participant
14	ANEEL	Ordinance nº 2103 from 03/08/2016, authorizing the startup of generation unit 3, 4 and 5 on 04/08/2016	03/08/2016	Project participant
15	UHTP	Spreadsheet with data from the water level (reservoir area): Dados_operacionais_CHTP_2015.xlsx Dados_operacionais_CHTP_2016.xlsx Dados_operacionais_CHTP_2017.xlsx	2015 2016 2017	Project participant
16	UHTP	Official Email informing the meters' change on 19/10/2017 (RES Extrato de Coleta dos Dados de Medição no SCDE - (TELES PIRES) - Outubro 2017.msg)	25/10/2017	Project participant
17	Prolux Engenharia de Sistemas	Calibration certificate number 2015-466, for the energy meter PT-121A044-01, calibration performed on 30/09/2015 (CC_2015_464_TELES PIRES C1 500 KV – SE - PRINC.pdf)	Certificate dated 02/10/2015	Project participant
18	Prolux Engenharia de Sistemas	Calibration certificate number 2015-464, for the energy meter MT-1306A028-01, calibration performed on 30/09/2015 (CC_2015_464_TELES PIRES C1 500 KV – SE - RETAG.pdf)	Certificate dated 02/10/2015	Project participant
19	Prolux Engenharia de Sistemas	Calibration certificate number 2015-463, for the energy meter PT-1212A173-01, calibration performed on 30/09/2015 (CC_2015-463_TELES PIRES C2 500 KV – SE - RETAG.pdf)	Certificate dated 02/10/2015	Project participant
20	Prolux Engenharia de Sistemas	Calibration certificate number 2015-465, for the energy meter PT-1212A059-01, calibration performed on 30/09/2015 (CC_2015-465_TELES PIRES C2 500 KV – SE - PRINC.pdf)	Certificate dated 02/10/2015	Project participant
21	ANEEL	Companhia Hidrelétrica Teles Pires, technical sheet signed (Ficha Técnica Alstom - Assinada.pdf; Ficha Técnica CNO - Assinada.pdf; Ficha Técnica Voith - Assinada.pdf)	-	Project participant
22	COMPANHIA	Executive project, for the changes in the quota of	Jun/2014	Project

	HIDRELÉTRICA TELES PIRES	the project activity, due to IBGE change in orthometric altitude. (TX-RT-EC-LA-C20-00001.pdf)		participant
23	UHTP	Work license LT0443/2016, for meter replacement (LT 0443_2016.pdf) _ RES_ Ajuste da rede do IBGE.pdf,	12/07/2016	Project participant
24	Schneider Eletric	Factory calibration certificate for the energy meter serial number MW-1602A158-02 (Certificado de calibração medidor faturamento sobressalente 2.pdf)	09/02/2016	
25	CAM GyM	calibration certificate for the energy meter serial number MW-1602A158-02 (Certificado de calibração medidor faturamento sobressalente.pdf)	20/03/2016	PP
26	MCTI (Brazilian DNA)	Brazilian Resolution # 8 of 28/05/2008 defines the Brazilian Interconnected grid for CDM project, available at http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/cimgc/Comissao_Interministerial_de_Mudanca_Global_do_Clima_CIMGC.html	Accessed on 09/11/2017	Other
27	CCEE	CCEE report "MED003 - Medição da Geração e Consumo" (Consumption and Generation Measurements) for the UHE Teles Pires	2015-2017	PP
28	Companhia Hidrelétrica Teles Pires	Comparison between energy measurements and CCEE reports (gross enervgy) "Geração 2015.xlsx"; "Geração 2016.xlsx"; "Geração 2017.xlsx"	2015-2017	PP
29	Energisa	Invoices for the energy consumed from the grid (faturas ENERGISA.RAR; 11-2015.pdf; 12-2015.pdf; 01-2016.pdf)	2015-2017	PP
30	ONS	National Electric System Operator. Grid Procedures – Module 12: measurement for billing/Submodule 12.3 Maintenance of the system of measurement for billing.		

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	xx	Section no.	E.2	Date: DD/MM/YYYY
Description of FAR				
N/A				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				
				Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	1	Section no.	D.6.2	Date: 09/11/2017
Description of CL				

PP is requested to provide the evidences from CCEE to cross check the amount of energy delivered by the project activity to the grid (net energy). OBS: PP has provided the cross check of the gross energy.	
Project participant response	Date: 18/06/2018
<i>CER calculation spreadsheet is revised to include metered gross power generated (at the hydropower plant substation, see hourly metered generation), and final net energy considered (after commercial/technical adjustments by CCEE and energy consumed onsite discount). According to the methodology and registered PDD the net electricity delivered into the grid (metered at plant substation) should be used, but for conservative reasons the PPs considered the final energy after all adjustments by CCEE to calculate the CERs. Electricity consumed from the grid is discounted.</i>	
Documentation provided by project participant	
<ul style="list-style-type: none"> • Revised CER spreadsheet (CHTP_CERs_v.2_2018.06.11.xlsx); • Spreadsheets with the hourly metered electricity generated at the hydropower plant (November 2015 to January 2017); • CCEE reports (November 2015 to January 2017); • Receipts from electricity consumed from the grid (January 2016 to January 2017). 	
DOE assessment	Date: 09/08/2018
<p>PP has provided the evidences to confirm the energy delivered to the grid and energy consumed from the grid.</p> <p>For the year 2016, the amount of "Gross metered at CHTP in MWh" presented in the sheet "CCEE" is not in accordance with the <i>Spreadsheets with the hourly metered electricity generated at the hydropower plant</i> "Energia_Bruta_Exp_02_horaria_2016 rev02-.xlsx", it is not considering the first hour of each day.</p> <p>This CL remains open.</p>	
Project participant response	Date: 20/08/2018
<p>To the best of PPs understanding, the evidences to confirm the energy delivered to the grid and consumed from the grid are already supplied (abovementioned documentation provided by project participants, third and fourth items, namely, "CCEE reports..." and "receipts from electricity consumed...", see file "3_4-enviar para RINA.zip" sent on 04/07/2018). In the CCEE reports (energy delivered into the grid) one has to check for the "TGG" header and the monthly total ("total mensal"). For November 2015 the first week was discounted (dispatched into the grid but under test status) and, therefore, monthly total is the sum of weeks 2, 3, 4 and 5. In the Energisa receipts (energy consumed) one has to check entries for "consumo em kWh - ponta" and "consumo em kWh - fora ponta".</p> <p>The amount of "gross metered at CHTP in MWh" in the sheet "CCEE" was corrected to include the first metered hour in each month.</p>	
Documentation provided by project participant	
<ul style="list-style-type: none"> • Revised CER spreadsheet (CHTP_CERs_v.3_2018.08.20.xlsx) 	
DOE assessment	Date: 17/09/2018
<p>RINA verified that the revised spreadsheet is in accordance with the evidences.</p> <p>This CL is closed</p>	

CL ID	2	Section no.	D.8.2	Date: 09/11/2017
Description of CL				
PP is requested to update the calculation of the power density in accordance with the current installed capacity and reservoir area of the project activity.				
Project participant response				Date: 18/06/2018

<p><i>Explanations related to differences in the project installed capacity, please refer to the PP's response in CAR 1. Regarding reservoir area, please refer to the PP's response in CAR 8.</i></p> <p><i>Considering the revised installed capacity and reservoir area, the power density of the project decreased 8.1% changing from 13.51 W/m² at validation (1820 MW installed capacity and 134.7 km² total reservoir area, i.e., including the river bed area) to 12.42 W/m² (1820.025MW installed capacity and 146.50 km² total reservoir area), still significantly above the minimum power density of 10 W/m² to consider emissions from the reservoir to be zero. The change is included in the revised version of the MR.</i></p>	
<p>Documentation provided by project participant</p> <ul style="list-style-type: none"> Monitoring Report, version 2; Revised CER spreadsheet (CHTP_CERs_v.2_2018.06.11.xlsx). 	
DOE assessment	Date: 09/08/2018
<p>Revised MR presents the calculation of power density in accordance with the monitored parameters A_{PJ} and CAP_{PJ}. Project emissions is not applicable to the project activity.</p> <p>This CL is closed</p>	

Table 3. CAR from this verification

CAR ID	1	Section no.	D.3	Date: 09/11/2017
Description of CAR				
<p>Verified during the onsite visit that the installed turbines are different from the description in the registered PDD. Moreover, considering the power in kVA and potency factor of the generators, the total installed capacity of the generators is not considering the decimals (1820.25 MW of installed capacity). Provisions of the CDM project standard for project activities were not taken into account.</p>				
Project participant response				Date: 18/06/2018
<p>According to ACM0002 (version 13.0):</p> <p><i>"Installed power generation capacity (or installed capacity or nameplate capacity). The installed power generation capacity of a power unit is the capacity, expressed in Watts or one of its multiples, for which the power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units".</i></p> <p><i>While analyzing equipment tag, installed capacity of the project activity is 1820.025 MW instead of the figure of 1820.25 MW mentioned in the DOE's question above: 404,450 kVA x 0.9 = 364,005 kW x 5 generating units = 1820.025 MW. However, all official documentation of the project refers to the rounded installed capacity, as can be seen in ANEEL Ordinances of operation startup, Operation License and other public and official information available, which has been considered in the registered PDD. Although installed capacity presented in the registered PDD does not consider decimal places, the slight 0.025 MW difference (less than 0.01%) cannot be considered relevant as has an immaterial impact on generation of emission reductions (see Decision -/CMP.7 - Materiality standard under the clean development mechanism), additionality (no additional investment was made) and applicability of the methodology (no small scale criteria was impacted)..</i></p> <p><i>Furthermore, ACM0002 (version 13.0) requires monitoring of Cap_{PJ} parameter – installed capacity of the hydropower plant after the implementation of the project activity –, indicating that this parameter is not fixed/immutable during the crediting period. The difference is not a deviation to the registered project activity or an erroneous data and, therefore, it is PP's understanding that it such immaterial dissimilarity does not require any additional revision.</i></p> <p><i>Considering explanations above, the monitoring report is revised to consider the latest monitored data for Cap_{PJ} parameter.</i></p>				
Documentation provided by project participant				

- ANEEL Ordinance # 2,103 dated 3 Aug 2016: UG 3, UG 4 and UG 5 (364 MW installed capacity each);
- ANEEL Ordinance # 4,151 dated 29 Dec 2015: UG2 (364 MW installed capacity);
- ANEEL Ordinance # 3,646 dated 6 Nov 2015: UG1 (364 MW installed capacity);
- ANEEL Ordinance # 3,407 dated 06/10/2015;
- ANEEL Ordinance # 3,375 dated 02/10/2015;
- Operation License # 1272 dated 19 November 2014;
- Construction License # 818 dated 19/08/2011;
- EPC Contract signed on 19/08/2011;
- Pictures of generators and turbines' tags;
- Monitoring Report, version 2;
- Revised CER spreadsheet (CHTP_CERs_v.2_2018.06.11.xlsx).

DOE assessment	Date: 09/08/2018
<p>RINA verified that the ANEEL documents do not describe the decimal places. The installed capacity with decimal places (= 1820.025 MW) is considered in the revised MR and monitored parameter CAP_{PJ}.</p> <p>This CAR is closed.</p>	

CAR ID	2	Section no.	D.3	Date: 09/11/2017
Description of CAR				
MR did not include the Description of the installed technology, technical processes and equipment; and information on the implementation and actual operation of the project activity, including relevant dates (e.g. construction, commissioning, start of operation), as requested in the Instructions for completing the CDM-MR-FORM				
Project participant response				Date: 18/06/2018
Detailed description of installed technology, processes and equipment as well as relevant dates, were included in the revised version of the MR. Please refer to the second version of the document.				
Documentation provided by project participant				
<ul style="list-style-type: none"> • ANEEL Ordinance # 2,103 dated 3 Aug 2016: UG 3, UG 4 and UG 5 (364 MW installed capacity each) • ANEEL Ordinance # 4,151 dated 29 Dec 2015: UG2 (364 MW installed capacity) • ANEEL Ordinance # 3,646 dated 6 Nov 2015: UG1 (364 MW installed capacity) • Operation License # 1272 dated 19 November 2014 • Pictures of generators tag; • Monitoring Report, version 2; 				
DOE assessment				Date: 09/08/2018
<p>RINA verified that the revised MR was completed in accordance with the Instructions for completing the CDM-MR-FORM</p> <p>This CAR is closed</p>				

CAR ID	3	Section no.	D.4.3	Date: 09/11/2017
Description of CAR				
MR does not provide the approval dates and reference numbers of the post-registration changes, or provide the notification date, as described in the Instructions for completing the CDM-MR-FORM				
Project participant response				Date: 18/06/2018

<p><i>Due to delays in the operation start-up of the project, on 07 Dec 2016, the PPs requested the change in the starting date of the project crediting period from 01/01/2015 - 31/12/2024 to 07/11/2015 – 06/11/2025. Since the change is less than one year, the PPs were not required to request for approval by the Board of the change, but by means of a notification only. On 06 Mar 2017, the PPs received confirmation that the period was revised in the system. This information above was included in the revised version of the MR.</i></p>	
<p>Documentation provided by project participant</p>	
<ul style="list-style-type: none"> <i>Information (e-mails) exchange between the Project Participants and the CDM Team for changes in the crediting period;</i> 	
<p>DOE assessment</p>	<p>Date: 09/08/2018</p>
<p>RINA verified that revised MR presents the date (12/07/2016) that Project Participants notified the secretariat on regarding the change of the crediting period from 01/01/2015 – 31/12/2024 to 07/11/2015 – 06/11/2025.</p> <p>This CAR is closed</p>	

CAR ID	4	Section no.	D.6.2	Date: 09/11/2017
<p>Description of CAR</p>				
<p>In accordance with registered PDD and methodology ACM0002: (i) the quantity of electricity supplied by the project plant/unit to the grid and (ii) the quantity of electricity delivered to the project plant/unit from the grid shall be monitored. RINA verified that the MR is not considering the quantity of electricity delivered to the project activity.</p>				
<p>Project participant response</p>				<p>Date: 18/06/2018</p>
<p><i>Electricity consumed by the Project activity during the monitoring period (total of 2,345 MWh, 0.06% of the electricity generated by the plant) is included in the CER calculation spreadsheet. Electricity receipts in the period from January 2016 to January 2017 are provided. As there are no receipts available for the first two months of the period (November and December 2015) a conservative consumption of 400 MWh (higher than the highest consumption in the period, namely, 372 MWh in January 2016) is assumed.</i></p>				
<p>Documentation provided by project participant</p>				
<ul style="list-style-type: none"> <i>Receipts from electricity consumed from the grid (January 2016 to January 2017)</i> 				
<p>DOE assessment</p>				<p>Date:</p>
<p>PP has provided the invoices from ENERGISA to Teles Pires for the energy consumed from January 2016 to January 2017. For November and December 2015, the invoices were not available; therefore, PP is requested to consider the provisions of the project standard, para. 232</p> <p>This CAR remains open</p>				
<p>Project participant response</p>				<p>Date: 24/09/2018</p>

Energy consumed by the project from the grid is discounted from the energy dispatched into the grid. Evidences of the consumptions are invoices from the local utility (ENERGISA). Invoices from January 2016 to January 2017 are available and were submitted to the DOE. Invoices from November and December 2015 are not available and, therefore, the PPs will follow the procedure described in the Project Standard for Project Activities, version 01.0, paragraph 232, item a (PPs shall opt for item "a" OR "b".):

232. If the project participants are temporarily unable to monitor the registered CDM project activity in accordance with the monitoring plan in the registered PDD (hereinafter referred to as the registered monitoring plan), the applied methodologies or the applied standardized baselines, the project participants shall describe the nature, extent and duration of the non-conforming monitoring period in the monitoring report, and:

(a) Propose alternative monitoring arrangements for the non-conforming monitoring period. In this case, the project participants shall apply conservative assumptions or discount factors to the calculations to the extent required to ensure that GHG emission reductions or net anthropogenic GHG removals will not be over-estimated as a result of the deviation

The available invoices for the monitoring period (January 2016 to January 2017) indicate monthly average consumption of 125,731 kWh, minimum of 26,250 kWh and, maximum of consumption of 372,267 kWh. The proposed alternative monitoring arrangement is to consider for the two missing months the conservative (7% higher than the maximum consumption in the period, 1,424% higher than the minimum and 218% higher than the average) consumption of 400,000 kWh. It is also relevant to mention that the total energy dispatched into the grid considered for the emission reduction calculation was 3,988,244 MWh, already discounting the total energy consumed of 2,434,5022 kWh or, 2,435 MWh, i.e., the consumed energy represents 0,06% of the dispatched electricity, a figure with clearly immaterial impact on generation of emission reductions.

Documentation provided by project participant	
<ul style="list-style-type: none"> Revised Monitoring Report, version 3.0. 	
DOE assessment	Date: 03/10/2018
PP has chosen option a of the project standard. However, section B.2.1 of the monitoring report was not filled out. Moreover, additional information is requested to confirm if the procedure chosen is conservative in comparison to option b (ii) of the project standard. This CAR remains open	
Project participant response	Date: 11/12/2018
The PPs made contact to the utility providing the electricity during construction (Energisa Mato Grosso Dist de Energia SA) and the construction company itself (Construtora Norberto Odebrecht SA) and received electronic copies of the invoices for November and December 2015. The Monitoring Report and CER calculation spreadsheet were revised accordingly (no deviation required).	
Documentation provided by project participant	
<ul style="list-style-type: none"> Electronic copies of the invoices for consumed electricity in November and December 2015. Revised Monitoring Report (CHTP_Monitoring Report_v.5_2018.12.11.doc). Revised CER calculation spreadsheet (CHTP_CERs_v.5_2018.12.11.xlxs) 	
DOE assessment	Date: 13/12/2018
PP has provided the invoices. RINA verified that the documents were revised accordingly. This CAR is closed.	

CAR ID	5	Section no.	D.6.2	Date: 09/11/2017
Description of CAR				

In the CERs spreadsheet, the sum of hourly energy supplied to the grid used in the calculations of the emission factor (sheets "Emission factor") is not in accordance with the net energy used to calculate the CERs.	
Project participant response	Date: 18/06/2018
<i>Hourly energy supplied to the grid is revised. Please note that the final net energy considered (after commercial/technical adjustments by CCEE) is smaller than the one metered onsite (-2.77% on average and -2.80% in total). Although according to the methodology and registered PDD the net electricity delivered into the grid (metered at plant substation) should be used for CERs calculation, for conservative reasons the PPs considered the final energy after all adjustments by CCEE. Electricity consumed from the grid is also discounted.</i>	
Documentation provided by project participant	
<ul style="list-style-type: none"> Revised CER spreadsheet (CHTP_CERs_v.2_2018.06.11.xlsx) Spreadsheets with the hourly metered electricity generated at the hydropower plant (November 2015 to January 2017) CCEE reports (November 2015 to January 2017) Receipts from electricity consumed from the grid (January 2016 to January 2017) 	
DOE assessment	Date: 09/08/2018
RINA verified that for 2015, the CERs considered the conservative data in the CCEE report. For 2016 and 2017, PP considered the energy measurements, not the CCEE report. This CAR remains open.	
Project participant response	Date: 20/08/2018
CER calculation spreadsheet was revised/corrected to consider CCEE figures ("conservative data" or data including corrections, losses, consumption and commercial adjustments) also for 2016 and 2017 instead of the gross metered at CHTP.	
Documentation provided by project participant	
<ul style="list-style-type: none"> Revised CER spreadsheet (CHTP_CERs_v.3_2018.08.20.xlsx) 	
DOE assessment	Date: 17/09/2018
RINA verified in the revised spreadsheet that data used for the CERs calculation in 2016 is the "Gross metered at CHTP in MWh" column E, sheet CCEE. For 2015 and 2017 it is considered the conservative data (column C, sheet CCEE). This CAR remains open.	
Project participant response	Date: 24/09/2018
CER calculation spreadsheet was revised taking into account the corrective action request for year 2016.	
Documentation provided by project participant	
<ul style="list-style-type: none"> Revised CER spreadsheet (CHTP_CERs_v.4_2018.09.24.xlsx) 	
DOE assessment	Date: 03/10/2018
RINA verified in the revised spreadsheet considers the conservative data (column C, sheet CCEE). This CAR is closed.	

CAR ID	6	Section no.	D.6.2	Date: 09/11/2017
Description of CAR				
It is not provided in the monitoring equipment row the information on type, accuracy class, serial number, calibration frequency, date of calibration and validity in accordance with the Instructions for completing the CDM-MR-FORM.				
Project participant response				Date: 18/06/2018

<i>Detailed description of monitoring equipment was included in the revised version of the MR.</i>	
Documentation provided by project participant	
<ul style="list-style-type: none"> Monitoring Report, version 2; 	
DOE assessment	Date: 09/08/2018
<p>Revised MR does not present the last calibration certificate date for the meters PT-1212A173-01 (main) / MT-1306A028-01, PT-1212A059-01 (main) / PT-1212A044-01 (backup).</p> <p>Moreover, PP is requested to clarify the date of installation of the meter MW-1602A158-02</p> <p>This CAR remains open.</p>	
Project participant response	Date: 24/06/2018
<p>The monitoring report was revised to include the required information. Additionally documentation with detailed historic of maintenance of meters and calibration certificates covering the monitoring period is also submitted to the DOE.</p>	
Documentation provided by project participant	
<ul style="list-style-type: none"> MS-Excel spreadsheet with detailed historic of maintenance of meters from 2015 to 2018 ("CHTP-Medidores 2015-18.xlsx"). Scanned files (total of 9 pdf-files) of calibration certificates covering the monitoring period. 	
DOE assessment	Date: 17/09/2018
<p>PP has provided the following calibration certificates, however, they are not described in the revised MR:</p> <p>MW-1602A158-02 calibrated on 20/03/2016 (CAL042_15TELES PIRES C1 500 KV-SE-PRINC2.pdf)</p> <p>PT-1212A173-01 calibrated on 30/09/2015 (CC2015_463_TELES PIRES C2 500 KV-SE-RETAG.pdf)</p> <p>MT-1306A028-01 calibrated on 30/09/2015 (CC2015_464_TELES PIRES C1 500 KV-SE-RETAG.pdf)</p> <p>PT-1212A059-01 calibrated on 30/09/2015 (CC2015_465_TELES PIRES C2 500 KV-SE-PRINC.pdf)</p> <p>PT-1212A044-01 calibrated on 30/09/2015 (CC2015_466_TELES PIRES C1 500 KV-SE-PRINC.pdf)</p> <p>MW1602A158-02, calibrated on 17/10/2017 (CCR1084_17TELES PIRES C1 500 KV-SE-PRINC.pdf) - not applicable to the monitoring period</p> <p>PT1306A028-01 calibrated on 17/10/2017 (CCR1085_17TELES PIRES C1 500 KV-SE-RETAG.pdf) - not applicable to the monitoring period</p> <p>MW1611A979-02, calibrated on 19/10/2017 (CCR1086_17TELES PIRES C2 500 KV-SE-PRINC.pdf) - not applicable to the monitoring period</p> <p>PT1212A044-02 calibrated on 18/10/2017 (CCR1087_17TELES PIRES C2 500 KV-SE-RETAG.pdf) - not applicable to the monitoring period.</p> <p>For the installation date of the energy meter MW-1602A158-02, in the section D.2 it is described 25/10/2017 while in the section C, table 1 it is described 28/06/2016. Please, provide the evidence to confirm the date.</p> <p>This CAR remains open.</p>	
Project participant response	Date: 24/09/2018
<p>Description of the applicable [to the monitoring period] monitoring equipment in section D.2 revised.</p> <p>Change of the main energy meter, transmission line one (old meter, PT-1212A173-01, new meter, MW1602A158-02) was initiated with an authorization on 14/06/2016 and finalized on 12/07/2016 (CHTP work license - "licença de trabalho" - 0443/2016 supplied to DOE.)</p>	
Documentation provided by project participant	
<ul style="list-style-type: none"> Revised Monitoring Report, version 3.0. Revised spreadsheet with detailed historic of maintenance of meters from 2015 to 2017 ("CHTP-Medidores 2015-17.xlsx"). Teles Pires work license 0443/2016 	
DOE assessment	Date: 03/10/2018
<p>RINA did not find in the work license the equipments' change.</p> <p>This CAR remains open.</p>	

Project participant response	Date: 11/12/2018
<p>The PPs clarify that the work license (LT from the Portuguese “licença de trabalho”) LT0443/2016 for the replacement of the meter indicates authorization to start of the procedure on 14/06/2016. Initially the procedure was planned to resume on 17/06/2016. In the LT it can be seen that the procedure needed more time and the deadline was postponed to 30/07/2017. Finally the LT shows that the procedure resumed on 12/07/2018. To support the information contained in the LT, an additional report from the transmission line company (report NI-RO-MTE-0078-2016) indicating common/parallel procedures (“SE_PRT_Mantenção corretiva no sistema de faturamento na sala de relés da CHTP”) is also submitted.</p> <p>It shall be noted that during the corrective procedure period, both the old and the new meters calibration certificates were valid, see already submitted calibration certificates CC_2015_463 (old meter PT-1212A173-01, calibrated on 30/09/2015, valid up to 29/09/2017) and CAL_042_15 (new meter MW-1602A158-02, calibrated on 20/03/2016, valid up to 19/02/2018).</p>	
Documentation provided by project participant	
<ul style="list-style-type: none"> • Work license LT0443/2016 • Report NI-RO-MTE-0078-2016 • Revised Monitoring Report (CHTP_Monitoring Report_v.5_2018.12.11.doc). 	
DOE assessment	Date: 13/12/2018
<p>Monitoring report was correctly revised considering the evidences provided.</p> <p>This CAR is closed</p>	

CAR ID	7	Section no.	D.6.2	Date: 09/11/2017
Description of CAR				
<p>The meters described in the section C of the monitoring report, does not reflect all meters applicable to the monitoring period.</p>				
Project participant response				Date: 18/06/2018
<p>Section C of the Monitoring Report was revised to consider meters applicable to the monitoring period as checked during the site visit.</p>				
Documentation provided by project participant				
<ul style="list-style-type: none"> • Monitoring Report, version 2; 				
DOE assessment				Date: 09/08/2017
<p>Section C of the revised MR presents the meters applicable to the monitoring period.</p> <p>This CAR is closed</p>				

CAR ID	8	Section no.	D.6.2	Date: 09/11/2017
Description of CAR				
<p>Verified during the onsite visit that the water level was updated during the project implementation (220.44 m) and reservoir area (146.5 km²). Updated information is not considered, taking into account the provisions of project standard.</p>				
Project participant response				Date: 18/06/2018
<p>The PPs clarify that at the time of the PDD preparation, the reservoir area considered was 134.7 km² based on 220 m water level as checked during validation on ANEEL Technical Summary – Feasibility studies and Project Design (April 2008). However, the reservoir area was changed to 146.50 km² based on 221.59 m water level as can be seen in ANEEL Technical Record signed by Voith, CNO and Alstom. Changes were needed due to topographical differences, necessary for adjustments in water levels upstream and downstream.</p>				

Although the reservoir area increases, the change has immaterial impact on generation of emission reductions (see Decision -/CMP.7 - Materiality standard under the clean development mechanism), the project additionality (no additional investment was made), applicability of the methodology (the project is still under the power density criteria) or requirement to change the registered PDD (installed capacity and reservoir area are both monitored parameters). Considering the revised installed capacity and reservoir area, the power density of the project is 12.42 MW/km^2 ($1820.025 \text{ MW} \div 146.50 \text{ km}^2 = 12.42 \text{ MW/km}^2$).

According to the standard:

§8.3 Permanent changes; 8.3.1. Corrections; 233. If the project participants make any corrections to the project information or parameters fixed at registration of the CDM project activity as described in the registered PDD, the project participants shall document these corrections in a revised PDD”.

In light of the paragraph above, the PPs highlighted that installed capacity and reservoir are both monitored parameters for project emissions calculation as required by ACM0002 (version 13.0), i.e, they are not fixed or immutable parameters. Thus, in spite of the reservoir area change (immaterial according to the materiality standard under the CDM), it is the PPs' understanding that the parameter is and will be monitored throughout the project activity life and, therefore, no deviation process from the registered PDD is needed.

Considering the DOE comments, the power density calculation was revised in the MR.

Documentation provided by project participant

- Monitoring Report, version 2;

DOE assessment

Date: 09/08/2018

RINA verified that the increase in the project reservoir area is taken into account in the monitored parameter A_{PJ} in accordance with the applied methodology. The reservoir area was changed to 146.50 km^2 based on 221.59 m water level as can be seen in ANEEL Technical Record signed by Voith, CNO and Alstom (Ficha Técnica Alstom - Assinada.pdf; Ficha Técnica CNO - Assinada.pdf; Ficha Técnica Voith - Assinada.pdf). The water level is daily monitored by Teles Pires (niveis_vazoes_2015.xlsx; niveis_vazoes_2016.xlsx; niveis_vazoes_2017.xlsx)

This CAR is closed.

Table 4. FAR from this verification

FAR ID	xx	Section No.	Date: DD/MM/YYYY
Description of FAR			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		