

CDM Executive Board

TÜV NORD CERT GmbH

Langemarckstrasse 20
45141 Essen
Germany

Phone: +49 201 825-0
Fax: +49 201 825-2517

Info.tncert@tuev-nord.de
www.tuev-nord-cert.com

TÜV®

Our / Your Reference
11_001/1456

Contact
Rainer Winter
E-Mail: rwinter@tuev-nord.de

Direct Dial
Phone: -3329
Fax: -2139

Date
07.07.2011

Request for Revision of Monitoring Plan

5 MW Wind Power Project of Alembic Ltd at Bhavnagar, Gujarat, India, 1456

Dear Chair and Honourable Members of the CDM Executive Board,

Please find below the validation opinion of TÜV NORD JI/CDM Certification Program to the revision of the monitoring plan for the above mentioned project.

If you have any questions do not hesitate to contact us.

Yours sincerely,



Dipl.-Ing. Rainer Winter

Head of TÜV NORD JI/CDM Certification Program

Request for Revision of the Monitoring Plan, acc. to EB 49, Annex 28

For the following changes a revision of the monitoring plan is requested:

Requested Change #1

Type of revision:

- ☐ Due to a previously approved deviation from applied Methodology which continued in subsequent monitoring periods
- ☒ Due to a deviation from the registered Monitoring Plan

A. Description of requested change

The PP is requesting the revision in the monitoring plan due the FAR Q3 raised during the First Periodic Verification (<http://cdm.unfccc.int/Projects/DB/RWTUV1196336030.26/view>). Furthermore, under the provisions of para 17 and 18 of VVM version 01.2 the PP has integrated more clarity in the monitoring plan by including the definitions of terms and updated the monitoring plan. The Assessment team has checked and validated the aspects like change in the "Certificate for share of Electricity Generated by Wind Farm" issuing authority from GEDA to SLDC (from April 2010). The Assessment team also checked the steps taken by the PP in line with the FAR Q3 raised by the verification team during the First Periodic Verification.

B. Assessment of requested change

"5 MW Wind Power Project of Alembic Ltd at Bhavnagar, Gujarat, India" (hereafter referred to as project activity) was registered on 07 February, 2008 using the baseline and monitoring methodology "Grid connected renewable electricity generation" (AMS I.D, Version 11).

The project activity involves the establishment of 5 MW (4 x 1.25 MW) wind power plant located at Ukharla Trambak in the district of Bhavnagar and in the Indian state of GUJARAT. The monitoring of all Wind Turbine Generators (WTGs) of the Alembic Limited is done at a 33 KV metering point, which is dedicated only to the WTGs of Alembic Limited. Similar monitoring is followed for project proponents other than Alembic Ltd at the 33 KV Sub station. The electrical energy is delivered from this 33 KV substation to the 66 KV substation (Ukharla substation) and is measured at the 66 KV metering point installed at the substation.

This revision in the monitoring plan is done in line with FAR Q3 raised by the verification team during the First Periodic Verification. The FAR instructed the PP to take efforts for installation of the check meter in parallel to the existing trivector meter at 66 kV level to further strengthen the monitoring. The Assessment team also verified based on the submitted documentary evidence that PP has undertaken follow up with the Suzlon Infrastructure Services Limited vide letters dated 2010-08-05 and 2010-11-23. The Assessment team also noted that "Certificate for share of Electricity Generated by Wind Farm" issuing authority has changed from GEDA to SLDC vide letter dated VWD/Acctt./Rev./10/4273 issued on date 2010-06-05 by Madhya Gujarat Vij Company Limited. Thus, the SLDC is now the issuing authority for "Certificate for share of Electricity Generated by Wind Farm". The Assessment team also noted that in place of the trivector meter the "Certificate for share of Electricity Generated by Wind Farm" is based on the Availability Based Tariff Meter (ABT) meter at 66 kV sub-station from April 2010 onwards as per letter issued by Madhya Gujarat Vij Company Limited (GUVNL and its Subsidiary) letter reference VWD/Acctt./Rev./10/4273.

The assessment team confirms on basis of issuance of periodic monthly “Certificate for share of Electricity Generated by Wind Farm” that ABT meter has capability of recording reading at every 15 minutes. Thus, it is confirmed that the ABT meter will appropriately monitor the parameter “EGmeterT” in line with requirement of methodology. Furthermore, the monitoring plan stated the existence of the ABT meter for the monitoring at 66 kV level (not part of earlier version of revised monitoring plan

<http://cdm.unfccc.int/UserManagement/FileStorage/RC2KAU76BQ1GTLSME5JZVHP0FWOI9N>).

The Assessment team also noted that the ABT meter (accuracy class 0.2 S being very robust monitoring instrument is subjected to calibration routines once in three years (Letter issued by Gujarat Energy Transmission Corporation Limited, Letter Reference: ACE(R&C)/ GETCO/ EE-C/242; dated 2011-01-29). Thus as per the para 17.c, EB-58 Annex 23, the PP proposes the calibration frequency as “Once in a Three Years” which is acceptable by the Assessment team.

The Assessment team based on site visit interviews and its local and sectoral expertise in the installed metering system anticipated that there could be introduction of ABT meters at 33 kV metering point also. These changes can be updated directly in the monitoring report in case they happen during the course of time. The Assessment team noted that onboard controller meter installed on the individual WTG’s are not subjected to calibration and confirmed the same through the letter issued by Suzlon Infrastructure Services Limited dated 2011-01-27.

In response to the Clarification request of UNFCCC, vide email dated 2011-06-24 (Clarifications Requested for Request for revision of the monitoring plan 1456 5 MW Wind Power Project of Alembic) TUV NORD was requested to further clarify how compliance with FAR Q3 of the first periodic verification has been assessed. In compliance with FAR Q3 the Validation team further clarifies that the installation of a check meter to ABT meter is not in control of PP (reference of follow-up letter is available with Validation Team). In line with FAR Q3 the PP has proposed conservative methods for calculating the emission reduction in case of failure of meters and consequently the objective of determining real and conservative emission reductions behind raised FAR has been achieved. TUV NORD would like to point out that now more detailed explanation regarding the utilization of data sources as well as on the ER-calculation approach in case of meter failures have been added to the revised monitoring plan. As per the same the assessment on conservativeness of the emission reduction calculation in case of failure of 33 kV as well as 66 kV meters has been explained.. Though the check meter at the 33 kV as well as 66 kV level has not been installed the PP will ensure measurable, correct, accurate and conservative ER-calculation in the subsequent monitoring periods by means of applying conservative data/ assumptions derived from historic measurements. Both, at 33 kV as well as 66 kV level the highest percentage loss and highest historic % allocation from JMRs from historical verified values from previous verifications and the latest data from the JMR available till the start date of applied verification will be applied in order to ensure the most conservative ER-calculation of the present monitoring period.

A sample calculation for the application of the highest percentage loss and highest historic % allocation from JMRs has been carried out by the PP and is attached to the revised Monitoring Plan.

Further assessment details to the possible cases of malfunctioning meters are provided later in the text.

As a part of revision in monitoring plan the assessment team has compared the results of applied apportioning logic vs “Certificate for share of Electricity Generated by Wind Farm” at Ukharla Trambak.

Logic of Apportioning:

The apportioning approach used by the electricity utility to bill the PP for the electricity exported by the WTGs for Alembic Limited is done as per following procedure:

1. Enter the value of electricity received from W/M at 33 KV (kWh).

2. Enter the value of electricity supplied to W/M at 33 KV (kWh).
3. Take the difference of electricity received and supplied to W/F at 33 KV (kWh) [$EG_{\text{meter A}}$]
4. Take the difference of electricity as per the above steps 1 to 3 for each of the 33 kv meters (i) connected to the 66 kv metering point of Alembic Limited. [$EG_{\text{meter},i}$]
5. Take the sum of all the 33 kv meters connected to the 66 kv meter of Alembic limited.
[$EG_{\text{meter A}} + \sum EG_{\text{meter},i}$]
6. Divide individual difference by total calculated as per step 5 and multiply by 100 to find %.
[$EG_{\text{meter A}} / (EG_{\text{meter A}} + \sum EG_{\text{meter},i}) \times 100$]
7. Enter the value of electricity received from W/M at 66 KV (kWh).
8. Enter the value of electricity supplied to W/M at 66 KV (kWh).
9. Take the difference of electricity received and supply to W/F at 66 KV (kWh) [$EG_{\text{meter},T}$]
10. Multiply the value calculated as per step 9 by % allocation calculated as per step 6 to calculate the net electricity export allocated to Alembic Limited.

The Validation Team also confirms that there is no change in the apportioning mechanism applied by the GUVNL and its subsidiaries and the same remains consistent for the crediting period.

The Assessment team also noted that the PP has appropriately corrected the monitoring plan under section B.7.1 and included the unambiguous source of data for monitoring parameters ($EG_{\text{meter A}}$, $EG_{\text{meter},i}$ ($i=1,2,\dots,n$), $EG_{\text{meter T}}$ and EG_y).

For the parameters $EG_{\text{meter A}}$, $EG_{\text{meter},i}$ ($i=1,2,\dots,n$) the PP has appropriately corrected the data unit, improved the description of the parameter, updated the source of data (EB reading issued by OEM on periodic monthly basis), data type (measured and calculated) and the calibration frequency applicable to trivector and ABT meters respectively.

In case of malfunction of 33 kV meter, the PP will calculate conservatively $EG_{\text{meter A}}$ based on the highest historic transmission loss. The GUVNL will issue "Certificate for share of Electricity Generated by Wind Farm" based on its contemporary applicable procedure at the time of issuance. The PP has opted to apply the conservative value between the two to arrive at the emission reductions. The assessment team checked and confirms that the conservative approach applied by the PP in case of the failure of 33 kV meter for monitoring the $EG_{\text{meter A}}$ will lead to conservative estimation of emission reduction.

For the parameter $EG_{\text{meter T}}$ the PP has appropriately improved the description of the parameter, updated the source of data (Certificate for Share of Electricity Generated by Wind Farms Issued By GEDA/ SLDC/ GUVNL and its subsidiary), data type (measured and calculated), source of recording of parameter and the calibration frequency applicable to trivector and ABT meters respectively. The assessment team checked the conservative approach applied by the PP in case of the failure of 66 kV meter for monitoring the $EG_{\text{meter T}}$. The Assessment team assessed that consideration of readings of each PP will yield the highest percentage loss considering the reading of transmission loss from 33 kV meter to 66 kV Meter reading to conservatively arrive at $EG_{\text{meter T}}$. The PP further proposes to consider the most conservative value between the reading issued by GUVNL & its subsidiary companies (after failure of 66 kV level meter) and proposed conservative approach.

For the parameter EG_y (Net electricity substituted in the grid during the periodic year y), the PP has appropriately improved the description, source of data and QA/ QC procedure.

Furthermore, to enhance the clarity the PP has included "Definitions and Interpretations", line diagram along with revised monitoring plan. The Assessment team confirms based in its document review that the definitions are appropriate in context of the project activity.

Based on the guidance of the UNFCCC vide email dated 2011-04-21 (incompleteness received as Annex-4 was not included as a part of revised monitoring plan), the PP included Annex-4 along with revised monitoring plan. The DOE has validated the Annex-4, based on the document review

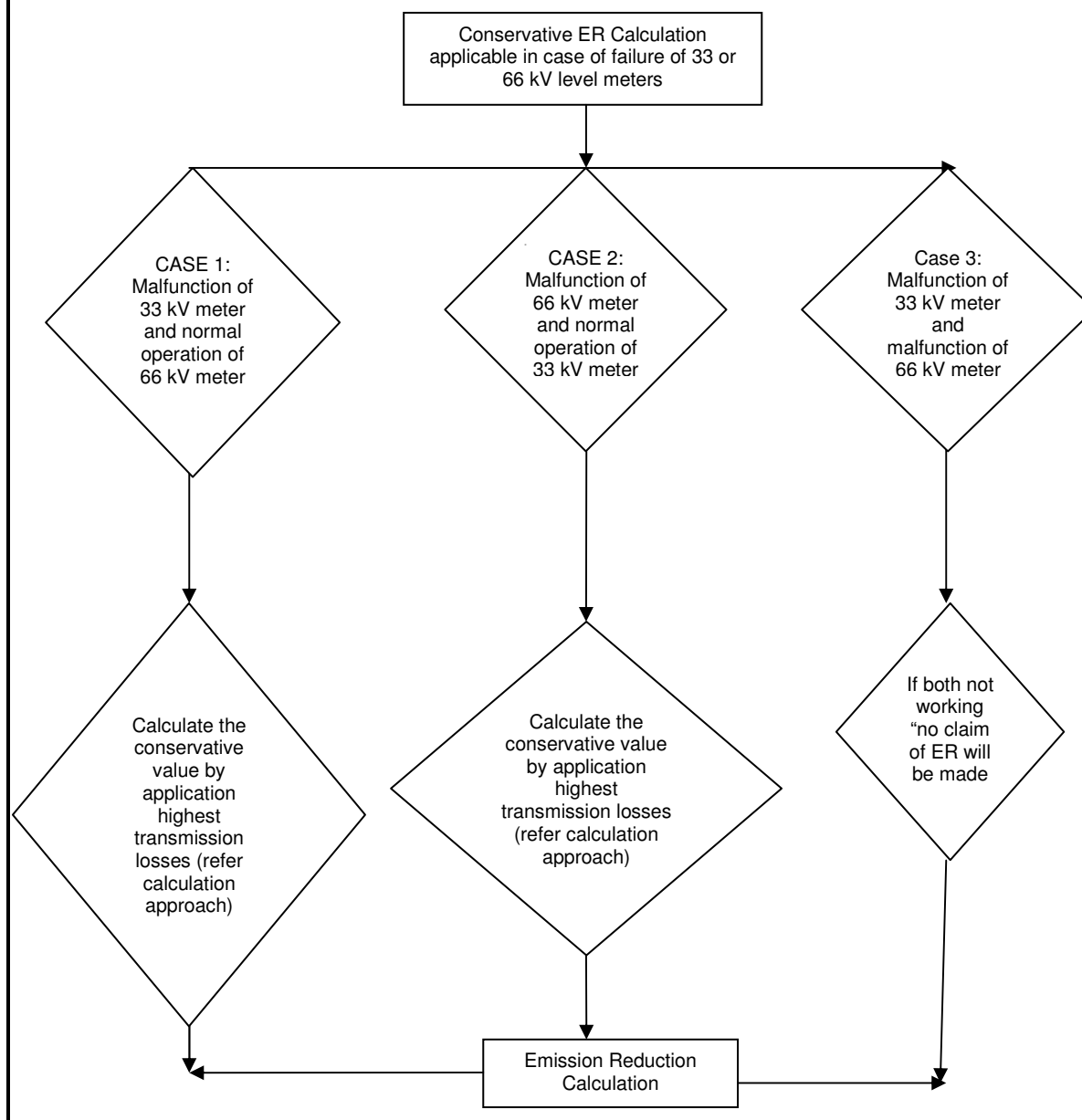
and site visit observations and found that the PP has appropriately included the details of the recording instruments, its location, calibration frequency, and accuracy class and confirms that background information used in the application of the monitoring methodology was appropriately updated.

Based on the guidance of UNFCCC, vide email dated 2011-06-24 (Clarifications Requested for Request for revision of the monitoring plan 1456 5 MW Wind Power Project of Alembic) the Validation team has included the detailed assessment on the emission reduction calculation for following possibilities of meter failure:

Case 1: Malfunction of 33 kV meter and normal operation of 66 kV meter

Case 2: Malfunction of 66 kV meter and normal operation of 33 kV meter

Case 3: Malfunction of 33 kV meter and malfunction of 66 kV meter



Case 1: Malfunction of 33 kV meter and normal operation of 66 kV meter

In case of malfunction of 33 kV meter, the calculation will be performed on the basis of WTG controller meter reading and 66 kV meter. Based on the publically available historic data (available in public domain since First periodic Verification till the time of application for verification), the PP will calculate net export of electricity by the project activity as follows

- a. Electricity exported by WTGs of Alembic at 33 kV level will be evaluated by application of the highest transmission loss between WTG generation meters and reading recorded at 33 kV substation (Assessment of data of First Periodic Verification yields this value as 4.32%, this value is subjected to change with more conservative value during course of crediting period with performance of project activity). Furthermore, the conservative value at 66 kV meter is calculated by application of the highest historic transmission loss between 33 kV meter and 66 kV substation to conservatively calculated electricity export at 33 kV level (Assessment of data of First Periodic Verification yields this value as 1.64%, this value is subjected to change with more conservative value during course of crediting period with performance of project activity).
- b. The 66 kV meter provides the electricity imported by the WTGs connected to the substation meter. The highest historic % allocation from JMRs from first periodic verification till the submission of MR for verification for Alembic will be calculated. The same % allocation will be applied to calculate conservatively the electricity imported.
- c. The net electricity exported to grid will be difference between outcome of step a, b.

Extract of results of JMR Vs Applied Assessment for March 2008 to December 2008:

Year 2008	JMR Value	Case 1: Malfunction of 33 kV meter and normal operation of 66 kV meter	Conservative Value for emission reduction calculation (Y/N)
March	743760	723130	Y
April	626940	609660	Y
May	1227420	1199475	Y
June	1629000	1536634	Y
July	1292580	1250926	Y
August	1233720	1189126	Y
September	855000	828455	Y
October	223200	209313	Y
November	529740	501117	Y
December	694440	679309	Y
Total (kWh)	9055800	8727144	Y

Case 2: Malfunction of 66 kV meter and normal operation of 33 kV meter

In case of malfunction of 66 kV meter, the calculation will be performed on the basis of 33 kV meter reading. Based on the publically available historic data (available in public domain since First periodic Verification till the latest available date till the submission of MR for verification), the PP will calculate the reading at 33 kV as follows

- a. The conservative value of export of electricity to grid at 66 kV meter is calculated by application of the highest transmission loss between 33 kV meter and 66 kV substation (Assessment of data of First Periodic Verification yields this value as 1.64%, this value is

subjected to change with more conservative value during course of crediting period with performance of project activity).

- b. The 33 kV meter provides the electricity imported by the WTG's connected to the sub-station meter. The electricity imported will be conservatively calculated as follows

Electricity imported = electricity import reading at 33 kV/ (1- highest historic transmission loss between 33 kV meter and 66 kV substation)

Assessment of data of First Periodic Verification yields this value as 1.64%, this value is subjected to change with more conservative value during course of crediting period with performance of project activity

- c. The net electricity exported to grid will be difference of outcome of step a, b.

Extract of results of JMR Vs Applied Assessment for March 2008 to December 2008:

Year 2008	JMR Value	Case 2: Malfunction of 66 kV meter and normal operation of 33 kV meter	Conservative Value for emission reduction calculation (Y/N)
March	743760	727505	Y
April	626940	614984	Y
May	1227420	1205957	Y
June	1629000	1601849	Y
July	1292580	1271327	Y
August	1233720	1212703	Y
September	855000	838197	Y
October	223200	215870	Y
November	529740	517736	Y
December	694440	681375	Y
Total (kWh)	9055800	8887501	Y

Case 3: Malfunction of 33 kV meter and malfunction of 66 kV meter

Simultaneous malfunction of 33 kV and 66 kV meter: In such case the PP will not apply for emission reduction calculation for the period of malfunction of both the meters.

Extract of results of JMR Vs Applied Assessment for March 2008 to December 2008:

Year 2008	JMR Value	Case 3: Malfunction of 33 kV meter and malfunction of 66 kV meter	Conservative Value for emission reduction calculation (Y/N)
March	743760	PP will ignore that "Specific" period while evaluating emission reductions	Y
April	626940		Y
May	1227420		Y
June	1629000		Y
July	1292580		Y
August	1233720		Y
September	855000		Y

October	223200		Y
November	529740		Y
December	694440		Y
Total (kWh)	9055800		Y

The Validation team confirms that period of evaluation to arrive at the transmission loss (WTG meter to 33 kV meter and 33 kV meter to 66 kV meter) will be based on all the available data from the start date of crediting period (publically available from existing verifications) till the most recent JMR issued till the start for verification.

In line with the UNFCCC guidance, the Monitoring plan clearly states the number of PPs connected to 66 kV substation are 8. Please refer below details:

Sr. No	PP's	Installed Capacity (MW)
1	Alembic Ltd, Vadodara- (S4,S5,S6,S7)	5
2	Samay Electronics Pvt Ltd, Morbi	1.25
3	Umedica Laboratories Ltd, Mumbai	0.7
4	Real Strips Ltd, Ahmedabad	1.25
5	Raajratna metal Ind, Ahmedabad	1.25
6	Intas Pharmaceuticals Ltd, Ahmedabad	1.25
7	Jaybharat Dying & printing Pvt. Ltd, Suart	1.25
8	Ratnamani Metal & Tubes Ltd.,Ahmedabad	1.25
	Total	13.2

The Validation team however acknowledges that based on the decision of GUVNL and its subsidiary companies the arrangement may change. The name of the WTG owners can also change in case the WTG's are sold out by existing customers (other than Alembic WTG's). Such changes can be directly reported into monitoring report during periodic monitoring.

The Validation opinion is updated with respect to this evaluation.

The proposed revision in the monitoring plan does not impact the estimation of emission reductions for the proposed activity.

The DOE therefore concludes that Revision in the Monitoring plan will result in real measurable and attributable emission reductions.

C. Validation Opinion

- ☒ TÜV NORD herewith confirms that the proposed change ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced.
- ☒ TÜV NORD herewith confirms that the proposed change is in accordance with the applied approved monitoring methodology, not compromising the conservativeness in the monitoring and verification process and of the emission reduction calculations.
- ☒ TÜV NORD herewith confirms that the findings of previous verification reports, if any, have been taken into account.