Revision in Monitoring Plan

As per EB 49 Annex 28, the project participants shall implement the monitoring plan contained in the registered project design document. In case actual practice does not follow the practice described in the PDD, the revision in monitoring plan shall be requested. We will like to submit that net electricity exported to the grid at the Amarsagar substation was mentioned as the sole monitoring parameter in the registered PDD. The Amarsagar substations pools the electricity from wind farms located at Temdarai, Sodabandhan, Korwan, Asloi and other wind turbines at Bhu. Electricity delivered by all these wind farms are metered at a common metering point. It is therefore important to describe the allocation plan that will describe the net electricity exported to the grid by the WEGs included in the project activity. We have therefore revised the monitoring in section B.7.1, B.7.2 and Annex 4 of the PDD. The revised sections of section B.7.1, B.7.2 and Annex 4 in clean and track mode are provided as attachments to the form for revision in monitoring plan approved by EB.

1. The project activity is located in Bhu and is connected to Amarsagar substation. In addition to the project activity, the wind farms located at Temdarai, Sodabandhan, Korwan, Asloi and other wind turbines at Bhu are also connected to the Amarsagar substation. Electricity delivered by all these wind farms are metered at a common metering point. The common metering point comprises two main meters i.e. Main meter 1 and Main meter 2 that are installed at 132 kV metering point at the Amarsagar substation. Consequently, the main meter readings reflect the aggregate electricity supplied by all these wind farms, including the project activity. The net electricity supplied by individual wind turbines is determined by following a process of allocating the total electricity (recorded at the main meters M1 and M2) to the individual turbines in proportion of the electricity generation recorded by the LCS meters at the individual wind turbines. The procedure for allocation is detailed below and empirical formulas are given in annexure 1.
2. The allocation of the net electricity supplied to the grid at the Amarsagar substation by the WEGs included in the project activity is done on basis of export multiplication factor and import multiplication factor. LCS meter is located inside the WEGs. The LCS meter records the electricity export on continuous basis and is archived in the electronic format. Summation of electricity export recorded by LCS meters is compared with the energy export and import recorded at the Amarsagar substation.
3. The export multiplication factor is calculated as a ratio of electricity export at the Amarsagar substation noted in the Joint meter report to the summation of the electricity export of LCS meters for all the WEGs connected to the wind turbines. Likewise import multiplication factor is calculated as a ratio of electricity import at the Amarsagar substation noted in the Joint meter report to the summation of the electricity export of LCS meters for all the WEGs connected to the wind turbines.
4. The electricity exported by the WEGs included in the project activity is calculated by multiplication of the export multiplication factor with energy export recorded at the LCS meter of the WEG. Likewise electricity imported by the WEGs included in the project activity is

calculated by multiplication of the import multiplication factor with energy export recorded at the LCS meter of the WEG.

5. There are two main and two backup meters at the Amarsagar substation and pooling substation of Enercon respectively. The Joint meter reading is taken each month at main meters at the Amarsagar substation and the backup meters at the pooling substation of Enercon. Joint meter reading is noted in the presence of the representatives of Enercon and the state utility.
6. The main and the backup meters are calibrated once each year. The LCS meters does not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case there is any mismatch in the energy values recorded by the LCS meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. The operations and maintenance staff will replace the meter immediately and correction factor of the defective meter will be determined. The correction factor will be applied to the LCS meter reading up to the last months meter reading. Therefore the proposed revision of the monitoring plan ensures that the level of accuracy and completeness in the monitoring parameters.

We therefore would request the EB to approve the proposed monitoring plan.

For Enercon India Limited

ENERCON (INDIA) LIMITED MUMBAI

Authorized Representative

Dated: February 01, 2010

Annexure 1

Annexure 1

The project activity is located in Bhu and is connected to Amarsagar substation. In addition to the project activity, the wind farms located at Temdarai, Sodabandhan, Korwan, Asloi and other wind turbines at Bhu are also connected to the Amarsagar substation. Electricity delivered by all these wind farms are metered at a common metering point. The common metering point comprises two main meters i.e. Main meter 1 and Main meter 2 that are installed at 132 kV metering point at the Amarsagar substation. Consequently, the main meter readings reflect the aggregate electricity supplied by all these wind farms, including the project activity. The net electricity supplied by individual wind turbines is determined by following a process of allocating the total electricity (recorded at the main meters M1 and M2) to the individual turbines in proportion of the electricity generation recorded by the LCS meters at the individual wind turbines. The procedure for allocation is detailed below:

$E_{JMR,Export}$ = Electricity exported, as recorded by the main meter at the substation

$E_{JMR,Import}$ = Electricity imported, as recorded by the main meter at the substation

$E_{Controller,Export}$ = Electricity exported by a WEG, as measured at the controller

$\sum E_{Controller,Export}$ = Electricity exported by all the WEGs connected to the main meter at the substation, measured at the controller of each WEG

$E_{WEG,Export}$ = Electricity exported by a WEG to the grid, calculated

$E_{WEG,import}$ = Electricity imported by a WEG from the grid, calculated

Electricity exported by each WEG is apportioned on the basis of electricity exported recorded at the controller of each WEG and the electricity exported at the main meter and mentioned in the JMR. The export multiplication factor is calculated as follows-

$$\text{Export Multiplication factor} = \frac{E_{JMR,Export}}{\sum E_{Controller,Export}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Thus the energy exported by a WEG to the grid is given by the equation-

$E_{WEG,Export}$ = Export Multiplication factor x $E_{Controller,Export}$ ……..(2)

As the controller meter doesn't record import, the apportioning of energy imported by each WEG is also done on the basis of electricity exported recorded at the controller of each WEG and the electricity imported at the main meter and mentioned in the JMR. The import multiplication factor is calculated as follows-

$$\text{Import Multiplication factor} = \frac{E_{JMR,import}}{\sum E_{Controller,Export}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Thus the energy imported by a WEG to the grid is given by the equation-

$E_{WEG,import}$ = Import Multiplication factor x $E_{Controller,Export}$ .....(4)

The net electricity exported by the WEGs of the project is given by the equation-

$EG_y = \sum_{Project} E_{WEG,Export} - \sum_{Project} E_{WEG,import}$ .....(5)

The summation is done on the WEGs belonging to the project activity.