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Response to Request for Review

Dear Sirs

Please find below the response to the request for review formulated for the CDM project with the registration number 1011. In case you have any further inquiries please let us know as we kindly assist you.

Yours sincerely,

Javier Castro
Carbon Management Service

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Response to the CDM Executive Board

Request 1

For the calculation of baseline N2O emission factor, both N2O values and NAP values measured beyond the length of normal campaign length during the production of the quantity of nitric acid (i.e. the final tonnes produced) were eliminated. Further clarification is required on how the DOE has verified the baseline N2O emission factor considering that methodology specifies that N2O values measured beyond the length of normal campaign length are to be eliminated from the calculation of baseline emission factor.

Request 2

Further clarification is required on how the DOE verified the monitoring of temperature and pressure of stack gas in accordance with the applied methodology which specifies two seconds monitoring frequency.

Request 3

The methodology requires that EN14181 shall be used as the basis for selecting and operating the monitoring system. Further clarification is required on how the DOE verified

3-1) The results of weekly zero and span checks due to QAL3; and

3-2) Whether the annual functional test was performed/planned according to the methodology considering that the monitoring system had been operating since the baseline campaign started on 15 September 2006.

Request 4

Clarification is required on the inconsistencies of normal operating temperature and pressure reported in the monitoring report and in the PDD, and CLnormal (campaign length) in the monitoring report, the spreadsheet, and the PDD

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Response by TÜV SÜD:

1. Clarification on how the DOE has verified the baseline N2O emission factor

During the Initial Verification audit and the Verification of the 1st Monitoring Period performed on site, the DOE audit team has verified with special awareness all the SAP production records to check the Nitric Acid Production (NAP). SAP is the official system used by Rhodia for production management. Once the data are entered into SAP they cannot be changed. The Verification Report (no. 1161123 from 31 October 2008) issued by the DOE lists reference 21 "CDM 1011 Previous_Campaign.xls" sheet "Campaign Information" which is a summary of the SAP production data that have been verified by comparing it to the figures in the SAP. Annex 1A is showing the "CDM 1011 Previous_Campaign.xls" sheet "Campaign Information" and Annex 1B is showing SAP print screens of the Nitric Acid Production for two campaigns before the baseline campaign (22/07/2004 to 09/01/2005 and 19/01/2005 to 25/06/2005) as an example.

The final submitted workbook (the former version was revised according to CAR#8 which explicitly states that exactly this requirement of the methodology was not fulfilled) includes in the calculation of the emission factor EF_{BL} only values for NAP and N2O-values (concentration and flow) up to the defined historical campaign length (CLnormal). CLnormal was reached on 20.March 2007.
It was checked by the verifier that no N2O-values neither nitric acid production values beyond this date were included in the revised workbook respectively in the calculation.

2. ***Clarification on how the DOE has verified the monitoring of temperature and pressure of stack gas in accordance with the applied methodology which specifies two seconds monitoring frequency***

The DOE verification team has checked in detail the 2-second raw data acquisition system and all the data handling which are in place to calculate the N2O emission factor (see Verification Report, no. 1161123 from 31 October 2008; Annex 1 – item G5) which were found to comply with the requirements of the methodology.
As explained in the Verification Report (see table page 53 of 75 and data flow diagram page 55 of 75), the raw data are transmitted to the PLC from where they are stored in the computer of the Nitric Acid plant control room, which has a back-up in the Rhodia's corporate network. The data are collected by the PLC every 2 seconds which was assessed by the specification as well as zooming specific graphs to see the timely resolution of the system.

The verification team has also checked the raw data and hourly calculated values for the process and stack parameters that support the data entered into the Workbook for the emission coefficient calculation (see the referenced Verification Report, items 2.2, 3.3.1, 3.3.2 and FAR #7 issued by the verification team). The raw data (2-second data) are stored on electronic format in the corporate network and were also printed as graphs for all parameters of the baseline campaign. These print outs were also checked by the verification team

3.1 ***Clarification on how the DOE has verified the results of weekly zero and span checks due to QAL3***

The verification team checked the results of the zero and span registered in the CUSUM Chart (Excel sheet) by comparing the results with the certified span gas and zero value over the

whole period. In addition the qualification of the Rhodia personnel was checked by training documents which. QAL 3 performed by Rhodia personnel was assessed during the on-site by observing the handling.
The lab analyst was interviewed and showed the paper registers of the actions taken when there is a CUSUM alarm.

3.2 ***Clarification on how the DOE has verified whether the annual functional test was performed/planned according to the methodology***
According to EN 14181 the Annual Surveillance Test (AST) is a subset of the QAL 2.
QAL 2 has to be performed every three years. AST must been performed yearly in order to ensure that the calibration curve determined during the last QAL 2 is still valid.

The QAL 2 reports and confirmations (IRL 40, 54) show that three QAL2 were performed during the period from October, 2006 to March, 2008. None of the performed QAL2 completed one year hence no AST has to be performed.

4. Clarification is required on the inconsistencies of normal operating temperature and pressure reported in the monitoring report and in the PDD, and CLnormal (campaign length) in the monitoring report, the spreadsheet, and the PDD.
According to F-CDM-AM-Clar_Resp_ver 01.1 - AM_CLA_0063 the main purpose in the determination of the operating conditions is to avoid the overestimation of baseline emissions. The methodology includes a specific procedure to set the permitted working ranges and determine if the measurements in the baseline campaign are valid or not.

The methodology requires that the permitted range for parameters that influence the level of N2O formation (e.g., ammonia, ammonia-air input, temperature and pressure) is established from data gathered from at least the last five complete campaigns prior to the baseline campaign.

At the stage of registration of the PDD the values for the permitted ranges and CLnormal cannot be determined finally based on the requirements of the methodology, if the validation was performed prior to the end of the last historical campaign.
The last historical campaign is defined as the last campaign before the baseline campaign.
According to EB 31 § 28 " the Board clarified that either validating or verifying DOE could undertake the task of determination of the permitted operating conditions for project activities using approved methodology AM0034. The determination of the permitted operating conditions, if done at verification, should be as per the approved methodology."

The "permitted range" was verified by the DOE in the Initial Verification audit as explained in the Verification Report no. 1161123 from 31 October 2008, issued by the DOE – see Clarification Request #4. The detailed calculation were provided to the DOE in the excel file "CDM 1011 Previous_Campaign.xls" (reference list 21 in the Verification Report, annex 3).
The DOE verification team has extensively verified the production data during the on-site initial verification and subsequent verification audit performed on June 26-27, 2007 and April 01-02, 2008, respectively, and has closely checked the production records of the historical campaigns

(see Verification Report no. 1161123 from 31 October 2008) in order to determine the CLnormal.
The DOE verification team has verified with special awareness all the SAP production records to check the Nitric Acid Production (NAP). SAP is the official system used by Rhodia for production management. Once the data are entered into SAP they cannot be changed. The Verification Report (no. 1161123 from 31 October 2008) issued by the DOE lists reference 21 (on Annex 3) which is a summary of the SAP production data that have been verified.
Annex 1A is showing the ”CDM 1011 Previous_Campaign.xls” sheet “Campaign Information” and SAP print screens of the Nitric Acid Production for the two campaigns before the baseline campaign (22/07/2004 to 09/01/2005 and 19/01/2005 to 25/06/2005).

The spreadsheet and indication of the parameter in the monitoring are equal. However in some textual descriptions there are typos which indicate a wrong value (29 625 t instead of 28 695 t). Rhodia corrected these typos and provided a revised monitoring report rev. 4 which will be submitted to the UNFCCC.

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Response by Rhodia

Question #1:

For the calculation of baseline N2O emission factor, both N2O values and NAP values measured beyond the length of normal campaign length during the production of the quantity of nitric acid (i.e. the final tonnes produced) were eliminated. Further clarification is required on how the DOE has verified the baseline N2O emission factor considering that methodology specifies that N2O values measured beyond the length of normal campaign length are to be eliminated from the calculation of baseline emission factor.

Methodology AM0034 version 2 establishes the following criterion of "campaign length" for the baseline campaign:
*"**If $CL_{BL} > CL_{normal}$***
N_2O values that were measured beyond the length of CL_{normal} during the production of the quantity of nitric acid (i.e. the final tonnes produced) are to be eliminated from the calculation of EF_{BL}.".

Rhodia has issued two documents that show the compliance with the above criterion. Those documents have been verified by the DOE verification team, as follow:

1. Monitoring Report (reference 3 in Annex 3 of the Verification Report), on item 6.3, where the concepts defined by the methodology are presented and the data provided confirm the compliance with the methodology.

2. Workbkook_ER_NITRIC-PAULÍNIA rev. No.6 (reference 60 in Annex 3 of the Verification Report) which shows all the data used for calculating the emission reductions (ER). The values of CL_{BL} and CL_{normal} are demonstrated in the following worksheets of the Workbook:
   - BCS (Baseline Campaign Summary), where can be found the daily and accumulated nitric acid production (NAP). The total nitric acid production made in the baseline campaign was greater than the average historic campaign length that is 29695 tons. Therefore this value was utilized as CL_{BL} for ER calculation as required by the methodology. Thus the baseline campaign duration was cut on 20 March 2007 when the production of 29695 tons was achieved, in order to respect the methodology.
   - BCD (Baseline Campaign Data), where can be found both the hourly process parameters and the hourly N2O parameters (VSG=volume of stack gas and NCSG=N2O concentration in the stack gas). All N2O data which were acquired after 20 March 2007 were removed from the Workbook and therefore were not considered for the calculation of the baseline emission factor, as required by the methodology.

The Workbkook_ER_NITRIC-PAULÍNIA rev. No.6 has been uploaded by the DOE to the UNFCCC as a confidential document together with the Verification Report.

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Question #2:
Further clarification is required on how the DOE verified the monitoring of temperature and pressure of stack gas in accordance with the applied methodology which specifies two seconds monitoring frequency.

Files with the data obtained each 2 seconds were presented to the DOE auditors, as requested, during the Verification Audit performed on April 2008.
Moreover all 2-second raw data for both process and N2O parameters, as requested by the auditors (see FAR #7 on Verification Report), are archived by Rhodia as graphs on pdf format and on paper.
Examples of documents presented to the auditors (temperature and pressure data base and graphs obtained during 12 hours during the baseline campaign) are given in Annex 2A (temperature) and Annex 2B (pressure)

Question #3: (This item includes two different questions numbered 3.1 and 3.2 as follow)

The methodology requires that EN14181 shall be used as the basis for selecting and operating the monitoring system. Further clarification is required on how the DOE verified

Question 3-1 : The results of weekly zero and span checks due to QAL3;

In order to follow EN14181 Rhodia has implemented a QAL3 procedure, controlled by a certified 9001 Rhodia Quality System that consists in making weekly checks of the zero and span of the N2O analyzer AI-3500-C using the appropriate certified gas samples. During the audit this procedure was verified by DOE team.
The results indicated by the monitoring system during this experiment are compared with the true certified value of the synthetic gas sample and are plotted on CUSUM control charts to detect any drift. Adjustment of the zero and span was performed once after it was detected using the CUSUM chart that the upper control limit was reached.
Rhodia demonstrated to DOE auditors, that the CUSUM Control Chart was adopted according to the guidelines and algorithm stated in Annex C of the EN 14181:2004. The CUSUM control algorithm was implemented using an Excel sheet (as it is predicted on item 7.4 of EN 14181). A copy of this Excel sheet was given to the DOE during the audit.
The procedure for verifying the good performance of the monitoring system is done by a trained lab analyst, which was verified by DOE auditor as mentioned on item C.9 of Verification Report (page .pdf 31 of 75).

The methodology requires that EN14181 shall be used as the basis for selecting and operating the monitoring system. Further clarification is required on how the DOE verified

Question 3-2 : Whether the annual functional test was performed/planned according to the methodology considering that the monitoring system had been operating since the baseline campaign started on 15 September 2006.

The Annual Surveillance Test (AST) applied on Automated Measuring System (AMS) is a procedure to be performed one year after the QAL2 procedure was done in order to "*evaluate*

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whether the measured values obtained from the AMS still meet the required uncertainty criteria - as demonstrated in the previous QAL2 test" (reference: *EN 14181:2004, item 5.1*).

The first QAL2 was performed on October, 13th 2006. Therefore, an AST should have being done until October, 13th 2007. However, prior to that deadline, a new QAL2 procedure was done (August, 30th 2007) due to the addition of a new catalyst in the reactor to abate the N2O gas, considered as a major change of plant operation, as established on EN 14181:2004, item 6.1: "*The QAL2 procedures are repeated periodically, after a major change of plant operation, after a failure of the AMS or as required by legislation"*.
Those evidences can be verified on QAL2 worksheet from workbook (see Verification Report, no. 1161123 from 31 October 2008; Annex 3 – reference number 60).
In March, 30th 2008, a third QAL2 was done because the validity test of the calibration range indicated that more than 40% of the number of AMS measured values calculated over weekly basis were outside the valid calibration range for one or more week. According to section 6.5 of EN 14181, a full new QAL2 was necessary. The new QAL2 was then performed in March, 2008.
The AST is then planned to happen until March, 30th 2009, when the last QAL2 completes one year that was done

3.4 Question #4:
Clarification is required on the inconsistencies of normal operating temperature and pressure reported in the monitoring report and in the PDD, and CLnormal (campaign length) in the monitoring report, the spreadsheet, and the PDD.

The Normal Operating Temperature and Pressure which are in the PDD are the technical operating limits of the nitric acid plant in Paulínia. The upper limit of each variable is given by safety criteria, while for the lower limit corresponds to operation limit, and is part of the safety system of the plant. Both the lower limit and the upper limit are recorded in the Plant Operating Manual (a document controlled in the Rhodia Quality System) and are also in the plant operators log sheet.
In compliance with the methodology, the PDD states in paragraph B.6.1.1.i that "The "permitted range" for oxidation temperature and pressure is to be determined using historical data for the operating range of temperature and pressure from the previous five campaigns". In consequence, Rhodia used this criterion to determine the "permitted range" which is the range of operating parameters that should be used to determine the valid N2O data for estimating the baseline emission factor. According to the criterion selected, the permitted range is determined through a statistical analysis of the historical data in which the time series data is to be interpreted as a sample for a stochastic variable. All data that falls within the upper and lower 2.5% percentiles of the sample distribution is defined as abnormal and shall be eliminated. The permitted range of operating temperature and pressure is then assigned as the historical minimum (value of parameter below which 2.5% of the observation lie) and maximum operating conditions (value of parameter exceeded by 2.5% of observations).
After eliminating the outliers a new average of the N2O values is then calculated. Thus only the N2O values measured while the plant was operating inside the "permitted range" are used for calculation of the N2O emission coefficient, as required by the methodology.

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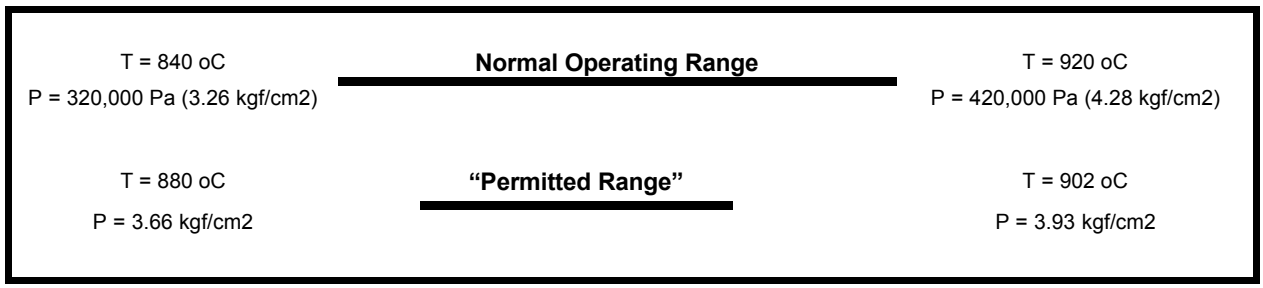
The picture below represents the relationship between the Normal Operating Range and the "permitted range".



Note: the unit for pressure is Pa in the PDD. The conversion of the values to kgf/cm2 which is the unit commonly used at the plant was made by multiplying the values in Pa by the conversion factor 0.0000101972.

In order to make more transparent such relationship between Normal Operating Range and "permitted range" Rhodia has decided to submit a revised Monitoring Report of the Baseline Campaign and of the 1st Project Campaign.

The ex-ante value of CLnormal (32 444 tons), as described on PDD, corresponds to an estimated average production value of campaigns used at the time of preparation of the PDD when the *ex-ante* calculation of the emissions reduction was performed. However, during the project implantation, it was applied the methodology AM0034 rev2 which requires that CLnormal be calculated as the average of the nitric acid production over the last 5 campaigns previous to the baseline campaign. The methodology also requires that if the production during the baseline campaign is higher than CLnormal then CLnormal should be used as CL_{BL}. CL_{normal} was then more accurately calculated using the production of the last 5 campaigns previous to the baseline campaign (respectively 37588 t, 30257 t, 25785 t, 27118 t and 27727 t from which the average production of 29695 t is calculated). In the Workbook this calculation is shown in worksheet "PC" and is used for the definition of $CL_{BL.}$ In the Workbook and in the monitoring report the value of CL_{normal} = 29 695 t is also used as CL_{BL}.