

Chair of the CDM Executive Board  
Mr. Clifford Mahlung

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#### **AM0034 version 4**

Dear Mr. Chairman,

N.serve Environmental Services GmbH as the author of AM0034 and developer of more than 30 CDM and JI projects using AM0034 would like to provide the following technical comments on AM0034 version 4 which was proposed by MP42 and approved by EB52.

Unfortunately, it was impossible to adequately comment in a timely manner on the proposed AM0034 version 4 prior to EB52 since the proposed revision was only published on January 28 and EB52 started on February 8. Hence, our comments are only received by the EB after AM0034 has been approved at EB52. However, we think that our comments merit another look at version 4 to make sure AM0034 remains practically applicable in future.

#### **A) 2-Second Data**

It is proposed in equations (3) and (6) (on pages 8 and 11 respectively) that the calculation of N<sub>2</sub>O mass flow by multiplication of VSG and NCSG should happen on basis of the 2-second values and not on the campaign averages as in the previous version of AM0034. Previously the 2-second data derived from the AMS were converted into hourly averages on site. The hourly averages were then used to derive the campaign mean values for NCSG and VSG separately before entering them into equation (1).

We would like to point out the following practical implications of such a change from campaign averages to 2-second data:

##### a) Accuracy/Precision

The main motivation of this change may be to increase the accuracy of the calculation. While it is likely to obtain a higher accuracy if the NCSG x VSG calculation is conducted on the hourly average rather than the campaign average, it remains highly doubtful if any increase in accuracy and precision can be obtained by conducting the calculation on 2-second data rather than the hourly average data. NCSG and VSG values are “out of sync” as the NCSG sample takes some time from the extraction point and sample conditioning system before it reaches the analyzer while the volume flow meter (as an in-situ measurement) basically measures in real-time. For example the VSG value measured at 12:34:56 does not necessarily correspond to the NCSG value with that time stamp because the NCSG value was actually taken out of the stack for example 20 seconds before that but the measurement in the analyzer happened at 12:34:56 and therefore that NCSG value receives the corresponding time stamp.

Statistical Evaluation of NCSG values (page 8, equation 3 and page 11 equation 6)

A new equation for calculation of NCSG has been proposed that supposedly generates an NCSG mean value over the baseline campaign that is weighted in terms of the corresponding stack gas volume flow (VSG). In this equation all NCSG and VSG results are to be multiplied on 2 second basis.

However, the methodology first requires the exclusion of NCSG and VSG data outliers (outside 95% confidence interval) in the statistical analysis on page 6. In addition, any NCSG and VSG values obtained during times when the plant was operating outside the permitted operating range are also to be excluded (see Note on top of page 8).

This leads to a contradiction between a) equation (3) according to which all 2-second values for NCSG and VSG data are to be used and b) the statistical analysis on page 6. It needs to be clarified which result for the NCSG and VSG data analysis is to be entered into equation (1). Also, clarification is necessary on how NCSG value for which the corresponding VSG value has been eliminated or missing is to be dealt with and vice versa.

The same principle applies to equation (6).

b) QAL2 Correction factors

The QAL2 tests and AST under EN14181 usually result in correction factors for NCSG and VSG which have to be applied to the data for the baseline and project emissions calculations. QAL2/AST has to be carried out once per year and the resulting correction factors are then applied to the NCSG and VSG of the current campaign and to all following campaigns until the next QAL2/AST. Under previous versions of AM0034 these correction factors were applied to the campaign averages of NCSG and VSG at the end of the campaign.

Under the new version 4 it will be impossible to apply the correction factors retroactively to the 2-second data of the campaign that is already running, thereby reducing the corrective effect usually resulting from QAL2/AST. This may impact on the accuracy of assessing emissions.

c) Missing Data

It is not clear from the current draft proposal how missing data for NCSG and VSG, for example during a calibration, should be taken into account. If for example NCSG is missing for 10 minutes because a routine automatic calibration was conducted, should the corresponding VSG values be discarded or should a proxy NCSG value (for example the last measured value) be inserted.

d) Data volume

Both the DOE and the UNFCCC require the provision of the data that formed the basis of the CER calculations. Up until now the hourly average data sets were easily provided in the form of Excel sheets. Other software packages as MS Access, for example, are more suitable for handling bigger volumes of data but MS Access is not commonly used by the DOEs or the UNFCCC and therefore data would always have to be exported into Excel.

There are 31,536,000 seconds in each year. Provided that a nitric acid plant operates for example 350 days each year, there will still be 15,120,000 2-second values per parameter in a year. Excel 2007 provides a maximum of 1,048,576 data rows. Excel 2003 (which most nitric acid plants still use its also the seems to be the most common template used by the UNFCCC) provides only a little over 65,000 data rows. Therefore, a total of more than 230 individual excel files are required to hold the data of one plant for one operating year.

This means that the DOEs and the UNFCCC will receive on average between 15 and 230 excel sheets containing 15,120,000 data rows from each AM0034 registered project in each year.

More importantly, it will become near impossible to conduct the necessary calculations in excel. If the calculations are done in a different program on the other hand (e.g. Access), the DOEs and UNFCCC may not be able to verify the calculations conducted.

This amount of raw data simply becomes highly impractical to handle for all parties involved. In addition, MS Access is far more difficult to operate compared to Excel.

In conclusion, the requirement to use the 2-second raw data as a basis for the necessary calculations is highly impractical while the improvements of the accuracy and precision of the calculations could be considered as doubtful.

### **B) Historical campaigns (pages 5, 6 and 10)**

For the determination of the “permitted range” only the five campaigns immediately prior to the baseline campaign may be used.

We would like to point out that this condition bears the risk of causing a “circular reference”! If for example the proposed baseline campaign is found invalid because the plant had been operating outside the permitted range determined as per the previous five campaigns (immediately prior) to the baseline, the PP is forced to include this invalid baseline campaign into the re-calculation of the permitted ranges, since this campaign which was deemed invalid (even by the means of the relevant methodology) now becomes the campaign immediately prior to the new baseline campaign. An invalid campaign becomes part of the definition for validity of future campaigns! In such a clear case, having to request a deviation before eliminating such a campaign provides an additional verification step, although AM0034 already indicates that it shall not be taken into account.

In addition, if the project has already been registered with an the operational ranges established at the time of validation in accordance with decision CDM EB 31, paragraph 28 and the intended baseline campaign fails to meet the AM0034 requirements, the permitted operating range will have to be re-established as part of the first verification. In practice this will mean that either a) the permitted operating range will have to be verified by the verifying DOE together with the baseline campaign whereas registration of the project can be granted beforehand, or b) future projects will face a serious delay in being able to accomplish registration since it will basically be required to have completed the baseline campaign first and make sure it is valid before being able to request the DOE to validate the permitted operating range and subsequently request registration .

### **C) Small editorial issues**

- a) Page 8 underneath equation 3 (if this section is adopted...)

“bmp = Baseline measurement period.

bcp corresponds to ...”

the “bcp” in the second, third and fourth line of the definition of “bmp” should probably read “bmp”?

- b) Page 12: “(subject to the elimination of data from the Ammonia/Air analysis, see above)” does not make sense in this context because during project campaigns no further date exclusion due to operational parameter limits takes place.
- c) Page 12 “ Project campaign length”

Two scenarios (a and b) are described, however the following possible scenario is not covered yet:

If  $CL_{BL} < CL_n < CL_{normal}$  no recalculation of  $EF_{BL}$  is necessary although  $CL_n < CL_{normal}$

- d) Page 19 “Parameter  $NCSG_{BC}$ ” Data unit (ppm or  $mg/m^3$ ) missing
- e) Page 20 “Parameter AFR” Monitoring frequency should be “every hour” instead of “continuously”
- f) Page 21 “ $CL_{BL}$ ” Monitoring frequency should be “after the end of Baseline campaign” instead of “each campaign”
- g) Page 23 “ $GS_{normal}$ ” and “ $GC_{normal}$ ” Monitoring frequency should be “Prior to end of baseline campaign” instead of “each campaign”
- h) Page 24 “GSBL” Monitoring frequency should be “Prior to end of baseline campaign” , Measurement procedures “For project crediting period” does not make sense.
- i) Page 24 “ $GC_{Project}$ ” monitoring frequency should be “After each project campaign”

#### **D) Conclusions**

We would recommend the following amendments to AM0034 version 4:

- a) The historical campaigns should be reasonably close in time to the baseline campaign but it should be allowed to have “intermediate” campaigns (campaigns that are neither historic nor baseline) between the baseline and the historic campaigns to avoid the need for re-validation if the intended baseline campaign falls outside the permitted operating range and has to be repeated. All versions of AM0034 contain provisions on the elimination of invalid baseline campaigns; therefore these campaigns should automatically be eliminated as historic campaigns.
- b) Not to require the use of 2-second data for calculations and reporting. It could however, be useful to require the calculation of  $N_2O$  mass flow by multiplication of VSG and NCSG on the basis of hourly average data instead of only doing that with the campaign average data to improve the accuracy and precision of the calculations.
- c) The exclusion of statistical outliers and the handling of periods of AMS downtime for NCSG and VSG should continue to apply before entering NCSG data into the proposed equation (3) or (6).

We hope that these technical comments are useful in the assessment and future evolution of AM0034 and we also hope that AM0034 version 4 can be further revised to take these comments into account to continue to have a practically workable AM0034.



Thank you for your consideration.

Most sincerely,

Albrecht von Ruffer

Managing Director  
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