



## 1998 CEMS Code Frequently Asked Questions

---

### REPORTING REQUIREMENTS AND GENERAL INFORMATION

1. **Question:** In sections 5.3 and 6.2 there is mention of an annual report. Is this report to be sent to Alberta Environment (AENV), or is it to be submitted to only the facility management?

**Answer:** *The annual report is to be submitted to the facility management, but not to the AENV. The report, however, must be retained and made available to the AENV upon request.*

2. **Question:** In section 6.2, it states that a quarterly report must be prepared, with the performance evaluations of initial certification performance tests, Relative Accuracy Test Audits and Cylinder Gas Audits. If the facility did not perform any of these evaluations during the quarter, do they need to report that they did nothing?

**Answer:** *No. Simply add a note to the final monthly report for that quarter stating that none of the performance evaluations were carried out.*

3. **Question:** If there is a conflict between the requirements of an approval and the requirements of the CEMS code, which one takes precedence?

**Answer:** *The code has been written with every attempt to avoid conflict with approvals, but if ever there is a case in which a conflict occurs, agreement with the approval takes precedence over agreement with the CEMS Code.*

### MONITORS AND SPECIFICATIONS

1. **Question:** On page 13, footnote 'a': Is this footnote correct? It appears that if this method is used, an exceptionally large range for relative accuracy is generated. For instance, if an approval limit for SO<sub>2</sub> is 2000ppm, the full scale would then be 2000ppm x 1.5 = 3000ppm. If the reference method indicates the source is emitting SO<sub>2</sub> at a low level, such as 200ppm, then the reference method value (~200ppm) would be less than 50% of the analyzer full scale (3000ppm x 50% = 1500ppm), and therefore would satisfy the requirements of footnote 'a'. The footnote indicates that 10% of full scale would then be used for the relative accuracy range for SO<sub>2</sub>, NO<sub>x</sub>, and CO in lieu of the limits listed within Table 7 (p.13). The range for relative accuracy would then be 3000ppm x 10% = + 300ppm, therefore giving a final relative accuracy value of 200ppm + 300ppm. Are these calculations correct?

**Answer:** *Yes, the footnote is correct, and yes, the calculations described in question 1 are correct. If the source is emitting at levels less than 50% of full scale, the acceptable range for relative accuracy becomes quite large.*

---



## 1998 CEMS Code Frequently Asked Questions

---

2. **Question:** In section 2.4, table 6, there are specifications listed referring to the temperature sensors. Do these specifications refer to temperature probes which are specified in a facility approval (*i.e.* stack top temperature probes), the temperature sensors which are part of the gas probes, etc., or do they refer to both of these situations?

**Answer:** *The answer to this question is currently being reviewed internally within the AENV. When available, the answer will be forwarded.*

3. **Question:** With regards to orientation sensitivity (CEMS Code section 4.2.5), does a facility pitot tube currently installed in a CEMS system need to be taken out of the stack and sent to a wind tunnel for testing?

**Answer:** *If the pitot tubes in question have been satisfactorily calibrated against a primary standard (a second pitot tube which has been calibrated in a wind tunnel), and no alterations or damage to the tubes has occurred since the calibration, then the pitot tube in question does not need to be sent to a wind tunnel for testing.*

4. **Question:** In relation to the daily calibration error limits, most parameters are given an error limit in percent of full scale. The scale of the analyzer is calculated as 1.5 times the permit limit, but there may be discrepancies regarding the rounding of this calculation to fit the typical settings of the analyzers. There is some concern that it is possible to take advantage of the rounding provision when setting the analyzer range. For example, if an approval limit was set at 14,000 ppm, the scale should then be 21,000 ppm ( $1.5 \times 14,000$  ppm), but one might choose an analyzer range of 25,000 ppm instead of 20,000 ppm in order to widen their calibration error gap. This would advantageously widen the permissible range for any limit which is calculated as a percentage of the span (range) value of the analyzer.

**Answer:** The range of an analyzer should be specified in the technical assessment or monitoring plan for a facility, and should identify any situations in which the 1.5x limit range of an analyzer cannot be met (either because the analyzer range is higher or lower than required). A facility requires the Director's approval to operate with an out-of range analyzer, and analyzers with large range discrepancies would not be accepted. If an analyzer is required to cover a range greater than the 1.5x limit, then the Director may stipulate that all relative calculations would have to be based on the 1.5x limit value instead of the actual analyzer range.

5. **Question:** If a source emits compounds other than the ones listed in the CEMS, what guidelines and limits will apply to them? Besides the information stated in section 4.2.7, are there any other guidelines, which should be followed?

**Answer:** *AENV recognizes the uniqueness of some facilities, and provides flexibility in section 4.2.7 to accommodate individual needs. Quality Assurance Plans (QAP) should be written to reflect the procedures and methods followed at the individual*

---



## 1998 CEMS Code Frequently Asked Questions

---

*site when dealing with unique compounds, and these QAPs will be judged on a case by case basis.*

### DATA GATHERING, USE, AND RETENTION

1. **Question:** If a source currently has a CEMS, but wants to replace the Data Acquisition System, what testing does one have to do to requalify the system?

*Answer:* Submit a brief summary to the AENV stating how the data transfer from the old system to the new system will be performed. AENV is most interested in how data integrity will be maintained, not only during transfer from the old to new system, but also for the new data the CEMS will be acquiring while the data transfer is occurring.

2. **Question:** Section 1.8, Data Retention, talks about "raw" data and "summary" data shall be maintained for a period of three and ten years, respectively. With respect to retention, does "raw" data refer to reported NO<sub>x</sub> values (i.e. ppm or Kg/h) as opposed to components associated with determining NO<sub>x</sub> value (i.e. temp., flow etc.)? Does "summary" data refer to monthly reports and QA/QC charts?

*Answer:* Raw data is the original, unmanipulated value obtained from an instrument or analysis (including human analysis and observations -- in other words, documents supporting the facility's QA plan, such as logbooks, are considered raw data). If data has been derived through calculations, it is not considered raw data, since any error which may have been introduced through the calculations would not necessarily be identifiable. Therefore if the reported NO<sub>x</sub> values (ppm, Kg/h) have been calculated using flow rates, temperature, etc., then it is the flow rate, temperature, etc., which is considered the raw data, rather than the reported NO<sub>x</sub> value itself. As per section 1.8 of the CEMS Code, the "raw data" must be consistent with the definition of "continuous" as defined in Appendix A. Part of that definition states that the device must be "capable of making a measurement of at least once every 15 minutes...", therefore if a CEMS collects data every minute, it is acceptable to retain only the 15 minute average of these data points, provided that any further calculations are based on that 15 minute average, not the minute to minute data points. This is a minimum requirement; more data points may be archived if desired.

*Summary data refers to calculated data, monthly reports, etc.*

3. **Question:** What is the definition of equally spaced data points? If a source has valid data for minutes 00-45, but only has one valid minute average in minute 50 for the last quadrant of the hour, should the data system use only data points for minutes 5, 20, 35, and 50, and discard the remaining data? If the source has valid data for minutes 50 and 51, can they pick between the data sets 5/20/35/50 and 6/21/36/51?
-



## 1998 CEMS Code Frequently Asked Questions

---

**Answer:** *No, all data points must be used. If a system normally collects a data point a minute, the system should take the data for minutes 1-15 and calculate an average, for 16-30 and calculate an average, and calculate averages for minutes 31-45 and 46-60. If however, the system collected a data point a minute for the minutes 1-45, then began a calibration at minute 46 and collected only one data point at minute 50 for the last 15 minutes of the hour, then average the points 1-15, 16-30, and 31-45 as usual, and report the data point at minute 50 as the average for the last fifteen minutes.*

4. **Question:** If all data points must be used, would it be more proper to compile all minute data into 15-minute averages, consider those fifteen-minute averages as "four equally spaced data points" and compile the hourly average from these?

**Answer:** *Yes.*

5. **Question:** The four-point requirement is sensible for a source operating the full hour. How should hours of partial operation be handled? Is there a minimum requirement for operating minutes for a reportable hour? If a source operates only X minutes, how many data points must be used to form a valid hour?

**Answer:** *In section 2.5.1 it states four points are required over one hour. This would relate to one point per fifteen minute period. If a source operates less than a full hour, then one point is required for every fifteen minutes, or portion of fifteen minutes, which the source is operating. The operating time of the plant is the factor on which the point requirements are based, regardless of whether or not calibration, maintenance or other duties are being performed (i.e. if the plant is not operating while a calibration is being run, then the calibration time does not require the collection of emission data points, as there is no emission data to collect).*

6. **Question:** A source must perform a calibration check on its monitor every day. If it fails to do so, does subsequent data become invalid? When does the data become invalid- from the scheduled time of its daily calibration, or from midnight of the day if failed to perform a calibration?

**Answer:** *If a source fails to do a calibration check, the subsequent data may or may not be considered valid, depending on the results of the next calibration. If the next calibration proves that the system is still operating within the required parameters, then the data in question may be considered valid. If however, the next calibration shows that the system is not operating within the required parameters, then the data in question would be considered invalid. It is, of course, understood that missing such calibrations would be a rare occurrence.*

*The CEMS Code states that calibrations must be performed once per 24 hour period. It is up to the facility to indicate in their Quality Assurance plan what the grace period surrounding the calibration time will be. If the data needs to be invalidated,*

---



## 1998 CEMS Code Frequently Asked Questions

---

*the end of the grace period will be considered the start of the invalid data (i.e. if a facility has determined in their QA plan that calibration will occur at 9:00am + 2 hours, then if the calibration has not occurred by 11:00am, then 11:00am will be the start time for the invalid data set).*

7. **Question:** If a source normally calibrates at 6:15 am, but the source shuts down at 3:00 am (before it runs its daily calibration), and is shut down for several days, is the data invalid from the time the source re-starts until it runs its daily calibration? Similarly, if a source has been shut down for several days, and re-starts at 11:30 pm, too late to run a complete calibration, is that last hour for that day invalid, because no calibration was run for that day? In some cases, the CEM equipment required the stack and probe to come to a stable temperature before a calibration could be properly run, a process that might take a few hours.

*Answer: The Quality Assurance plan for a facility should address issues such as these, possibly including a requirement for calibration at the time of start-up, then continuing calibration at the regular scheduled time. What may be applicable to one facility may not be applicable to another; hence it is the responsibility of the facility to ensure the data generated by the CEMS is reliable. The QA plan needs to outline how this will be accomplished.*

8. **Question:** Section 2.5.4 refers to allowing the source to insert substitute data into their database by a correlation technique, or possibly a predictive system (PEMS), if the monitors are unavailable and no certified backup monitoring data is available. However, such substituted data (from correlation techniques) is not credited towards monitor availability. What is the purpose of such substituted data? Data substitution has traditionally been seen only in emissions credit trading environments, where an estimate of emissions must be made during periods where data is not available. Lacking such a credit trading system, there seems to be no advantage or purpose in a correlation / substitution scheme.

*Answer: Although the data collected by substituted data does not count towards the availability of the monitoring system per se, it may be used to indicate whether or not a facility is remaining below the limits specified in their approval.*

9. **Question:** Is manual entry of data from a hardcopy printout a suitable method of backfilling data (e.g., if the data logger failed but it had printed out data before the failure), or is back-filling limited to electronic transfer of data?

*Answer: Manual entry of back-filled data is acceptable provided that the original data printout is retained and the reason for manual versus electronic entry is noted in an appropriate location.*

---