Question 8.31

Topic: Relative Accuracy and BAF Calculations -- Rounding Conventions

Question: When performing the bias test described in Section 7.6.5 of Appendix A or when calculating the percentage relative accuracy (% RA) or bias adjustment factor (BAF) for a CEMS, should we use in our calculations the rounded values of the "Arithmetic Mean of CEMS values," "Arithmetic Mean of Reference Method Values," "Arithmetic Mean of the Difference Data," "Standard Deviation of Difference Data," and "Confident Coefficient," as reported, in the <RATASummaryData> record for the RATA test?

Answer: No. These parameters are intermediate values in a calculation sequence that leads to final values of percent relative accuracy (% RA) and the BAF. These intermediate values are rounded off solely for EDR reporting purposes. The rounded values should not be used to perform the bias test or to calculate the % RA or the BAF. Rather, when performing the bias test or when calculating the relative accuracy and the BAF, you should retain the maximum decimal precision supported by the computer used (a minimum of seven decimal places) in all of the intermediate parameters.

This is in keeping with accepted professional standards and practice. (For example, American Society for Testing and Materials (ASTM), "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications," #E29-90, Section 7.3, states "When calculating a test result from test data, avoid rounding intermediate quantities. As far as practicable with the calculating device or form used, carry out calculations with the test data exactly and round only the final result.") The use of rounded intermediate quantities in a calculation sequence is likely to produce cumulative rounding errors.

References: Appendix A, Section 7.6.5; ECMPS Quality Assurance and Certification Reporting Instructions

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