

September 25, 2009

Mr. Dean Metcalf
Alternate Designated Representative
Xcel Energy
4653 Table Mountain Drive
Golden, CO 80403-1636

Re: Petition to Use Source-Specific Default Moisture Values for Unit 3 at Public Service Company of Colorado's (Xcel Energy) Comanche Power Plant (Facility ID (ORISPL) 470)

Dear Mr. Metcalf:

The United States Environmental Protection Agency (EPA) has reviewed the July 20, 2009 petition under §75.66 submitted by the Public Service Company of Colorado (PSCo), in which PSCo requested to use source-specific default moisture values, in lieu of the generic default moisture values in §75.11(b)(1), for Unit 3 at its Comanche Power Plant. EPA approves the petition, in part, as discussed below.

Background

PSCo owns and operates a new pulverized coal fired boiler, Unit 3, at its Comanche facility, located in Pueblo, Colorado. Unit 3 is a tangentially-fired, super critical, single reheat, dry bottom boiler, with a maximum rated heat input capacity of 6,984 mmBtu/hr. The unit is scheduled to commence commercial operation in September 2009 and will combust the same Powder River Basin sub-bituminous coal that is combusted in Comanche Units 1 and 2.

Unit 3 is equipped with state-of-the-art emission controls, including low-NO_x burners and selective catalytic reduction (SCR) for nitrogen oxides (NO_x) emissions control, a spray dryer absorber system for sulfur dioxide (SO₂) emissions control, sorbent injection system for mercury emissions control, and a pulse jet fabric filter for particulate control. The unit is subject to the Acid Rain Program. Therefore, PSCo is required to continuously monitor and report SO₂, NO_x, and carbon dioxide (CO₂) emissions and heat input for this unit, in accordance with 40 CFR Part 75.

To measure the NO_x emission rate (in lb/mmBtu) at Comanche Unit 3, PSCo will use a NO_x-diluent continuous emission monitoring system (CEMS) consisting of a dry-basis NO_x concentration monitor and a dry-basis CO₂ monitor. Because both NO_x and CO₂ are measured on a dry basis, a correction for the stack gas moisture content is unnecessary.

However, when PSCo determines the hourly SO₂ and CO₂ mass emission rates and the hourly heat input rates for Unit 3, a moisture correction is required. This is because the SO₂ and CO₂ monitors measure on a dry basis, while the stack flow monitor measures on a wet basis. Equation F-2 from Section 2.2 of Appendix F to Part 75 will be used to calculate the hourly SO₂ and CO₂ mass emission rates, and Equation F-16 from Section 5.2.2 of Appendix F to Part 75 will be used to determine the hourly heat input rates.

Part 75 provides two options for determining the stack gas moisture content when moisture corrections are required. The owner or operator may either report the appropriate fuel-specific default moisture value provided in §75.11(b) or, if this option is not viable, a continuous moisture monitoring system must be installed, certified, maintained, and operated. The fuel-specific default moisture value in §75.11(b) for sub-bituminous coal is 8.0% H₂O; this is the default value that would apply to Unit 3.

In the July 20, 2009 petition, PSCo seeks to extend a petition approval that was granted by the EPA on August 21, 2006, allowing the use of source-specific default moisture factors at other PSCo facilities, including Comanche Units 1 and 2. According to PSCo, the Unit 3 flue gas is expected to have a higher average moisture content than 8.0% H₂O. To support this claim, PSCo analyzed stack gas moisture data from a series of EPA Method 4 tests performed over the most recent three year period at Comanche Units 1 and 2, which burn the same coal as Unit 3 and use the same type of SO₂ controls. PSCo calculated a 10.6% and 9.0% source-specific default moisture values for Comanche Units 1 and 2, respectively.

When Unit 3 commences commercial operation, PSCo proposes to use the 8.0% default moisture content value for sub-bituminous coal from §75.11(b) for initial emissions data recording until Method 4 tests are completed during monitor certification. PSCo would then begin using the lowest moisture percentage obtained on any of the Method 4 runs in the emissions calculations. By selecting the Method 4 run with the lowest moisture percentage, PSCo would be using a conservatively low default moisture value in the calculations, thus significantly reducing the possibility of underestimating the unit's SO₂ and CO₂ emissions and heat input.

To ensure that the source-specific default moisture value continues to be an accurate representation of actual stack conditions, PSCo would update the default moisture value each year, using the results of Method 4 test runs conducted during the annual Part 75 relative accuracy test audit (RATA). Each year, the results of the latest Method 4 test runs would be added to a historical database, and a new source-specific default moisture value would be determined, based on the highest 10th percentile of the three most recent years of Method 4 data from the RATAs. The updated source-specific default moisture value would then be used for Part 75 reporting, beginning on the completion date of the latest series of Method 4 tests, and continuing until the next Method 4 test series is completed.

According to PSCo, this proposed approach to quantifying the stack gas moisture content has been satisfactory, and has increased the accuracy of the reported emissions data, for Comanche Units 1 and 2 and for the other PSCo units covered by the August 21, 2006 petition response from EPA.

EPA's Determination

EPA approves PSCo's petition to use source-specific default moisture values for Comanche Unit 3 in lieu of the 8.0% H₂O default moisture value for sub-bituminous coal specified in §75.11(b). EPA agrees that the default moisture percentage specified in §75.11(b) is too low for Unit 3. The Agency also approves PSCo's proposed procedure for determining the initial source-specific default moisture value for Unit 3 (i.e., the lowest moisture percentage obtained in any of the Method 4 test runs during the CEMS certification testing). However, for each annual update of the default moisture value, PSCo shall use the 10th percentile value derived from the three most recent years of Method 4 moisture data¹, rather than the highest annual 10th percentile value derived from Method 4 test run data from those three years. This is consistent with the petitions that EPA previously granted for Comanche Units 1 and 2, which required updating using the 10th percentile moisture value. Using 10th percentile moisture values is also consistent with the manner in which EPA determined the fuel-specific default moisture values for coal and wood combustion in §75.11(b)(1), as part of the May 1999 revisions to Part 75.² The 10th percentile value was selected because in Equations F-2 and F-16, as the moisture percentage decreases, the SO₂ mass emissions, CO₂ mass emissions, and heat input rate all increase. Therefore, using a conservatively low default moisture value in these equations significantly reduces the possibility of underestimating SO₂ and CO₂ emissions and heat input. If the 10th percentile value were determined separately for each year in the three most recent years and the highest of the three values were used as the default value, the default could be much less conservative and thereby increase the potential for underestimation.

PSCo shall represent the initial source-specific default moisture value in Unit 3's electronic monitoring plan, using a Monitoring Data Default record (see Section 10.0 of the Emissions Collection and Monitoring Plan System (ECMPS) Reporting Instructions for Monitoring Plans). PSCo shall report a Default Purpose Code of "PM" in this record, and a Default Source Code of "APP". For each annual update of the default moisture value, PSCo shall use the ECMPS Client Tool to close out the moisture value currently in use, by adding an appropriate end date and hour³ to the existing Monitoring Default Data record. Then, PSCo shall create a new Monitoring Default Data record, showing the updated default moisture value, with the appropriate begin date and hour⁴.

EPA's determination relies on the accuracy and completeness of the information provided by PSCo in the July 20, 2009 petition and is appealable under Part 78. If you

¹ Except for the first annual update, which will be based on only two years of data (i.e., from the initial certification testing and the first annual RATA).

² See 64 Fed. Reg. 28564, 28568, May 26, 1999.

³ That is, the completion date and hour of the most recent Method 4 test series.

⁴ That is, the date and hour following the completion date and hour referenced in n.3.

have any questions regarding this determination, please contact John Schakenbach at (202) 343-9158. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: Albion Carlson, USEPA, Region 8
Kirsten King, Colorado DOH
John Schakenbach, CAMD